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CRPL-F 251 PART A

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PART A
IONOSPHERIC DATA

ISSUED
JULY 1965

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 251
PART A

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
30 July 1965

IONOSPHERIC DATA

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IONOSPHERIC DATA

The CRPL-F series bulletins are issued as part of the responsibility of the Central Radio Propagation Laboratory for the exchange and distribution of ionospheric and related geophysical data. Part A, "Ionospheric Data," and Part B, "Solar-Geophysical Data," of the CRPL-F series present a variety of data collected by CRPL in the course of its research and service activities. Through the CRPL-F series, as part of the general exchange of scientific information, these data are made available for use by others in research on radio propagation and the ionosphere, and in other geophysical applications.

In the CRPL-F series, Part A, tables of monthly median values of vertical-incidence ionospheric data are presented accompanied by graphs of critical frequencies and $M(3000)F_2$. The tables include the number of values entering into the median determination (count). When available, the upper and lower quartile values (indicated by UQ and LQ) are listed for foF_2 , foF_1 , foE_s , $M(3000)F_2$, $h'F_2$ and $h'F$. Space limitations do not permit inclusion of quartile values for the other characteristics. The tables are prepared by machine methods and the graphs are plotted automatically.

The tables and graphs present the ionospheric data as received from the originating laboratory. Responsibility for the accuracy and reliability of the data rests entirely with the originator. Medians of data for the U.S. stations are computed by CRPL in accordance with the recommendations of the World-Wide Soundings Committee.

Data will appear in the F-series, Part A, only when the complete daily-hourly tabulations have been received by the CRPL or the World Data Center A for Airglow and Ionosphere. In general, priority of publication is given to the most current data. Data received too long after the month of observation may experience an indefinitely prolonged delay before finding space in the F series, Part A.

Information on symbols, terminology and conventions may be found in the "URSI Handbook of Ionogram Interpretation and Reduction of the World-Wide Soundings Committee," edited by W. R. Piggott and K. Rawer (Elsevier, 1961), which supersedes previous documents. A list of symbols is available from CRPL on request.

Units and Abbreviations of Ionospheric Data Tables

foF_2 , foE_s - - -	Tenths of a megacycle	MED -	Median
foF_1 , foE - - -	Hundredths of a megacycle	CNT -	Count
$h'F_2$, $h'F$, $h'E$ -	Kilometers	UQ -	Upper Quartile
$M(3000)F_2$ - - -	Hundredths	LQ -	Lower Quartile

Key to Points of Ionospheric Data Graphs

foF2: x foE : ○ M(3000)F2 : ◇
 foF1: Δ foEs: +

< Less-than value indicated. > Greater-than value indicated.
 - - - Interpolated value indicated.

The following table contains the latest available information on twelve-month smoothed average of observed Zurich relative sunspot numbers, beginning with the minimum of April 1954. Final numbers are listed through June 1964, the succeeding values being based on provisional data.

Smoothed Observed Zurich Relative Sunspot Number

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1954				3	4	4	5	7	8	8	10	12
1955	14	16	19	23	29	35	40	46	55	64	73	81
1956	89	98	109	119	127	137	146	150	151	156	160	164
1957	170	172	174	181	186	188	191	194	197	200	201	200
1958	199	201	201	197	191	187	185	185	184	182	181	180
1959	179	177	174	169	165	161	156	151	146	141	137	132
1960	129	125	122	120	117	114	109	102	98	93	88	84
1961	80	75	69	64	60	56	53	52	52	51	50	49
1962	45	42	40	39	39	38	37	35	33	31	30	30
1963	29	30	30	29	29	28	28	27	27	26	24	21
1964	20	18	15	13	11	10	10	10	10	10	10	11

THE IONOSPHERIC DATA PRESENTED IN THE 100 TABLES AND GRAPHS OF THIS ISSUE WERE ASSEMBLED BY THE CENTRAL RADIO PROPAGATION LABORATORY FOR ANALYSIS, CORRELATION, AND DISTRIBUTION. THE FOLLOWING ARE THE SOURCES OF DATA.

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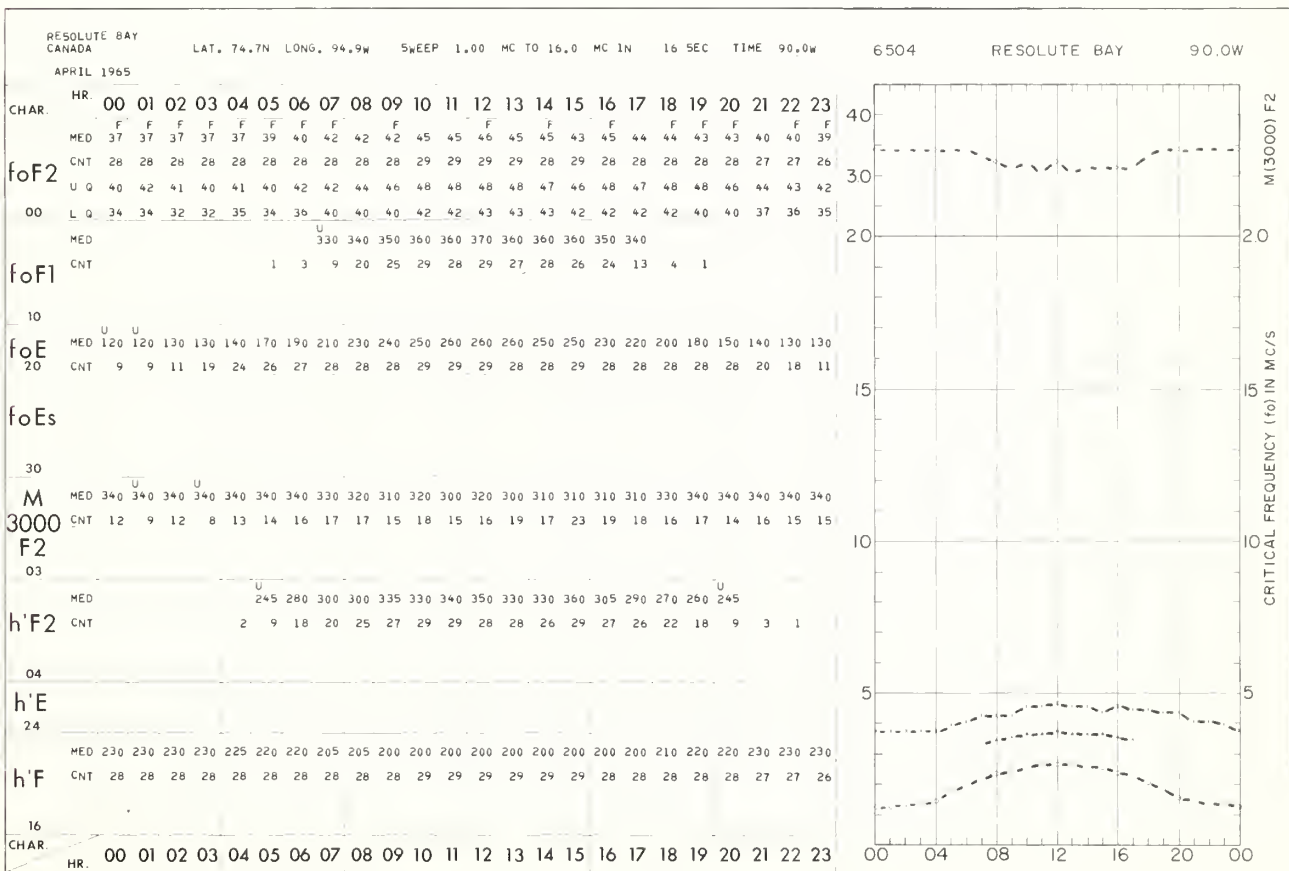
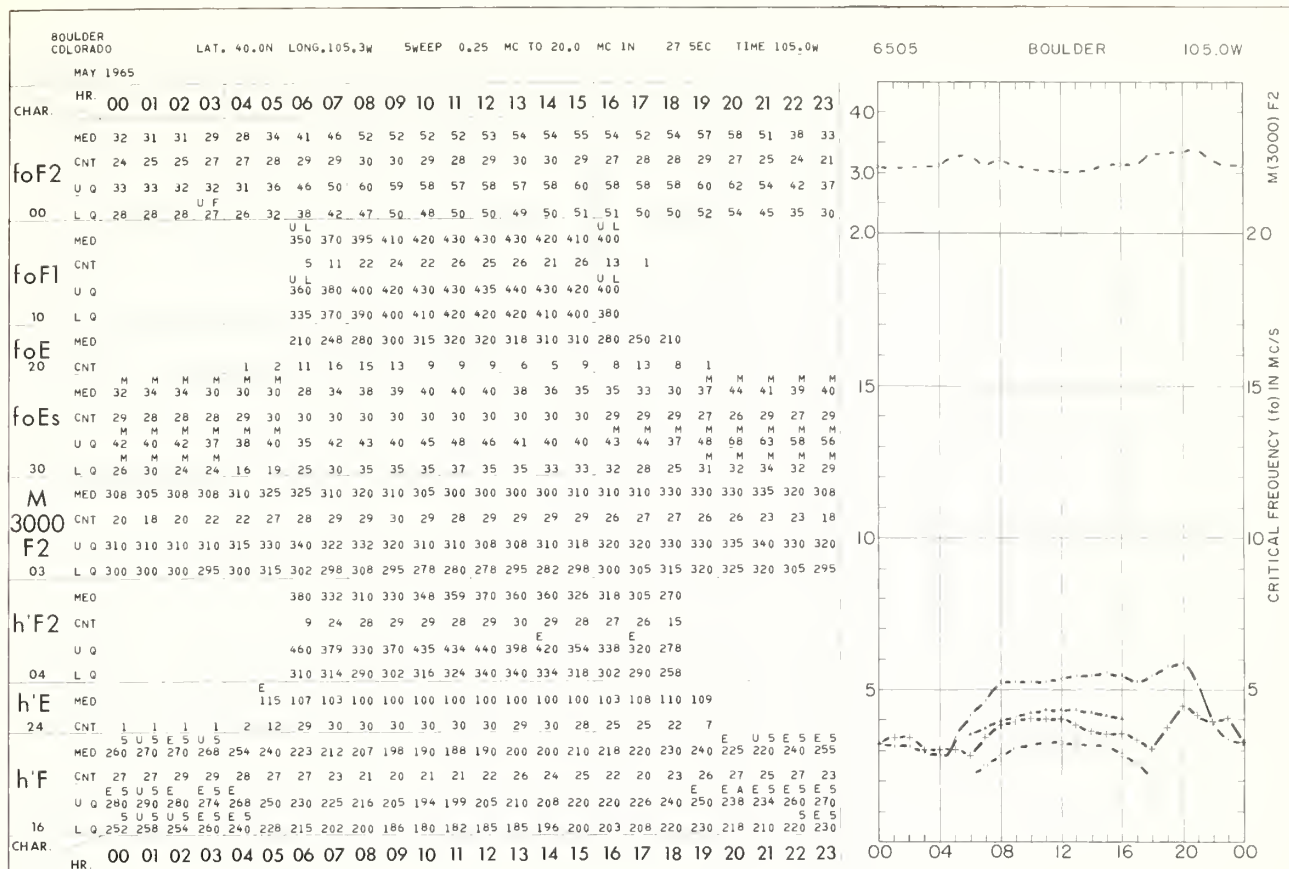
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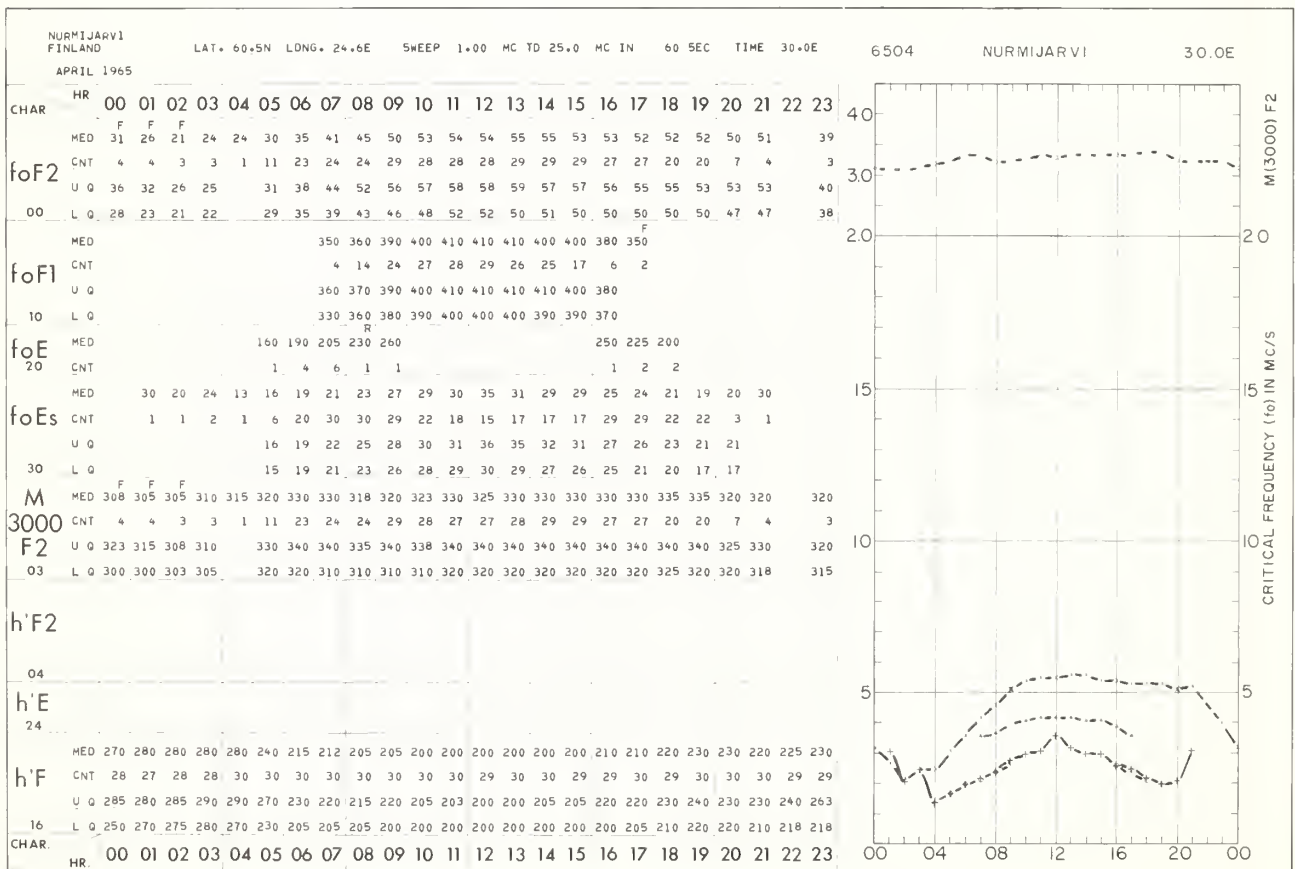
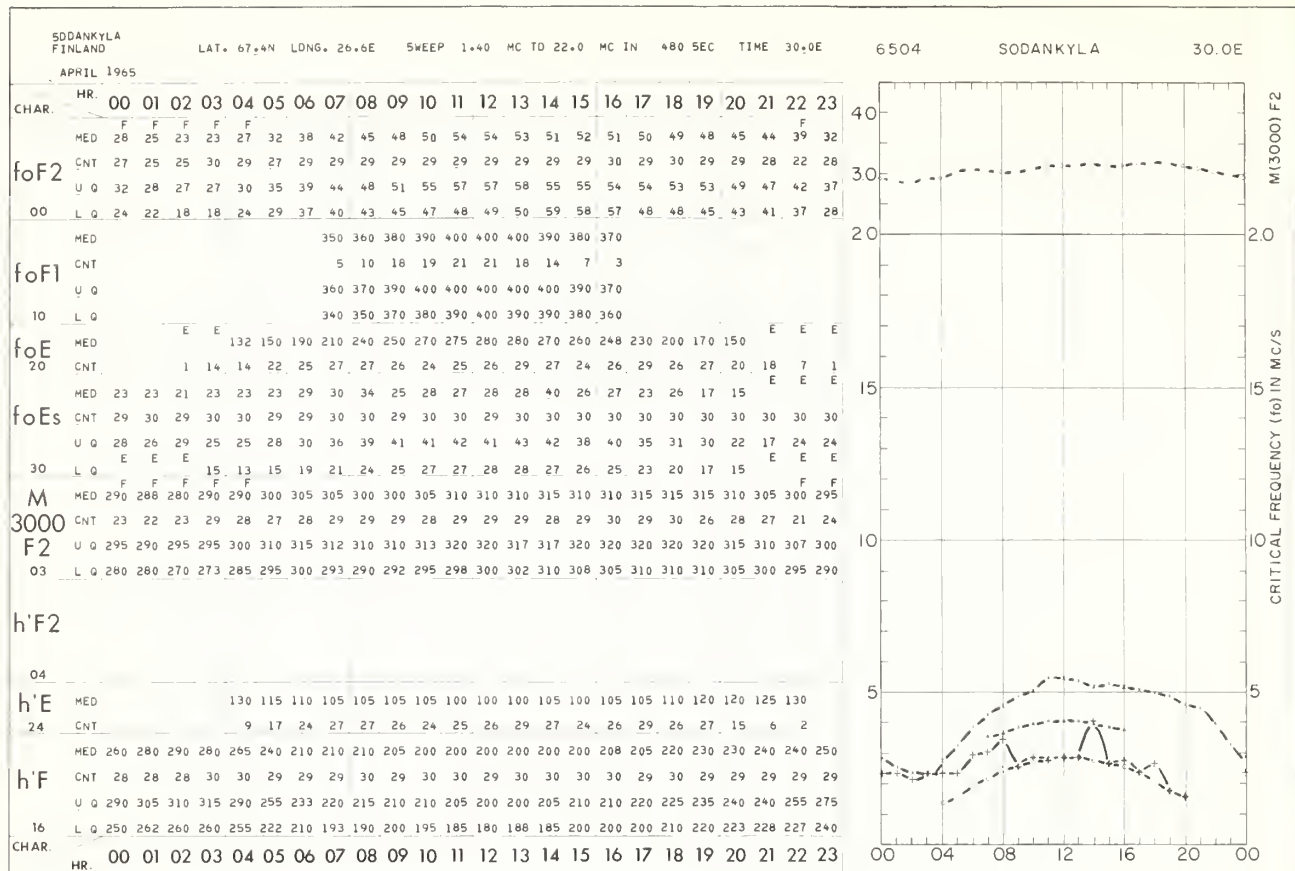
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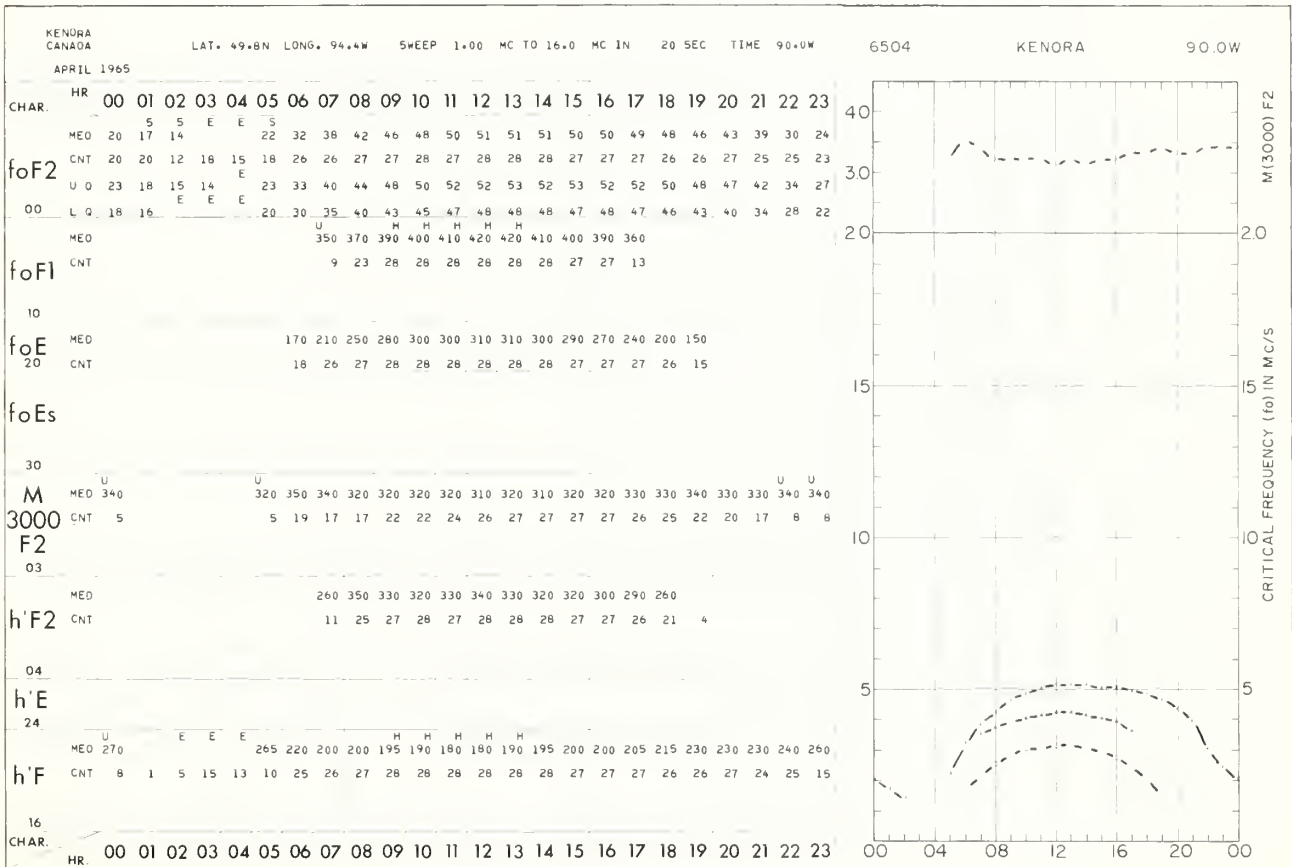
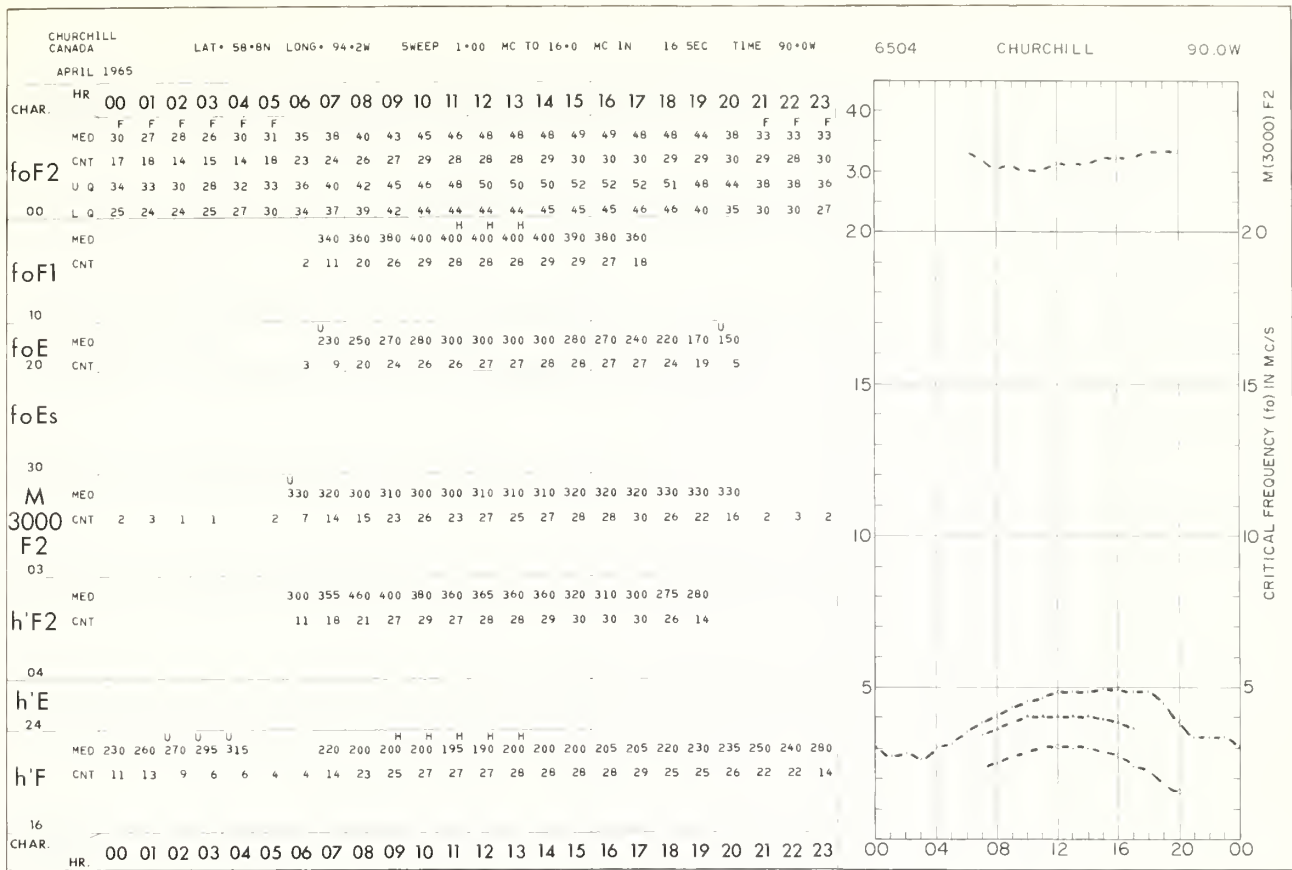
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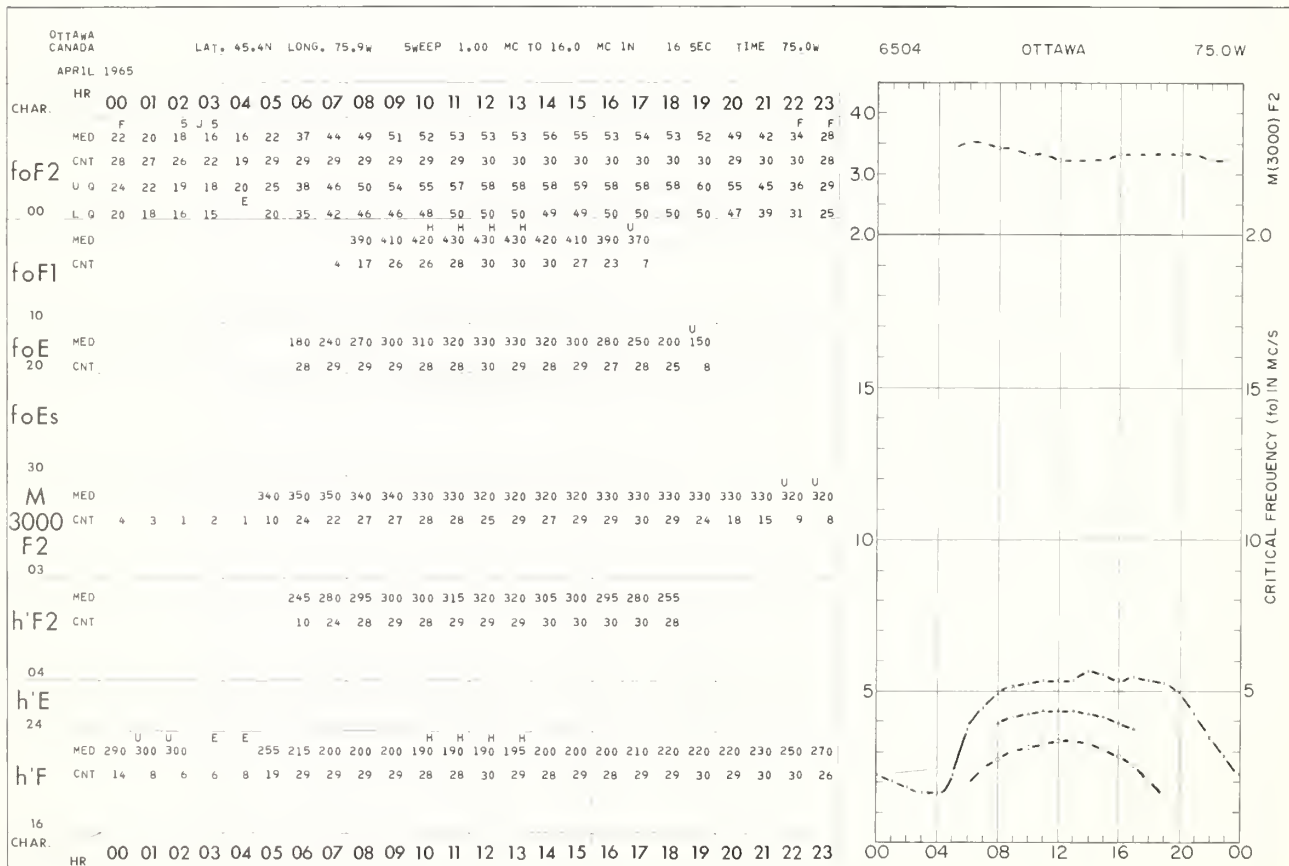
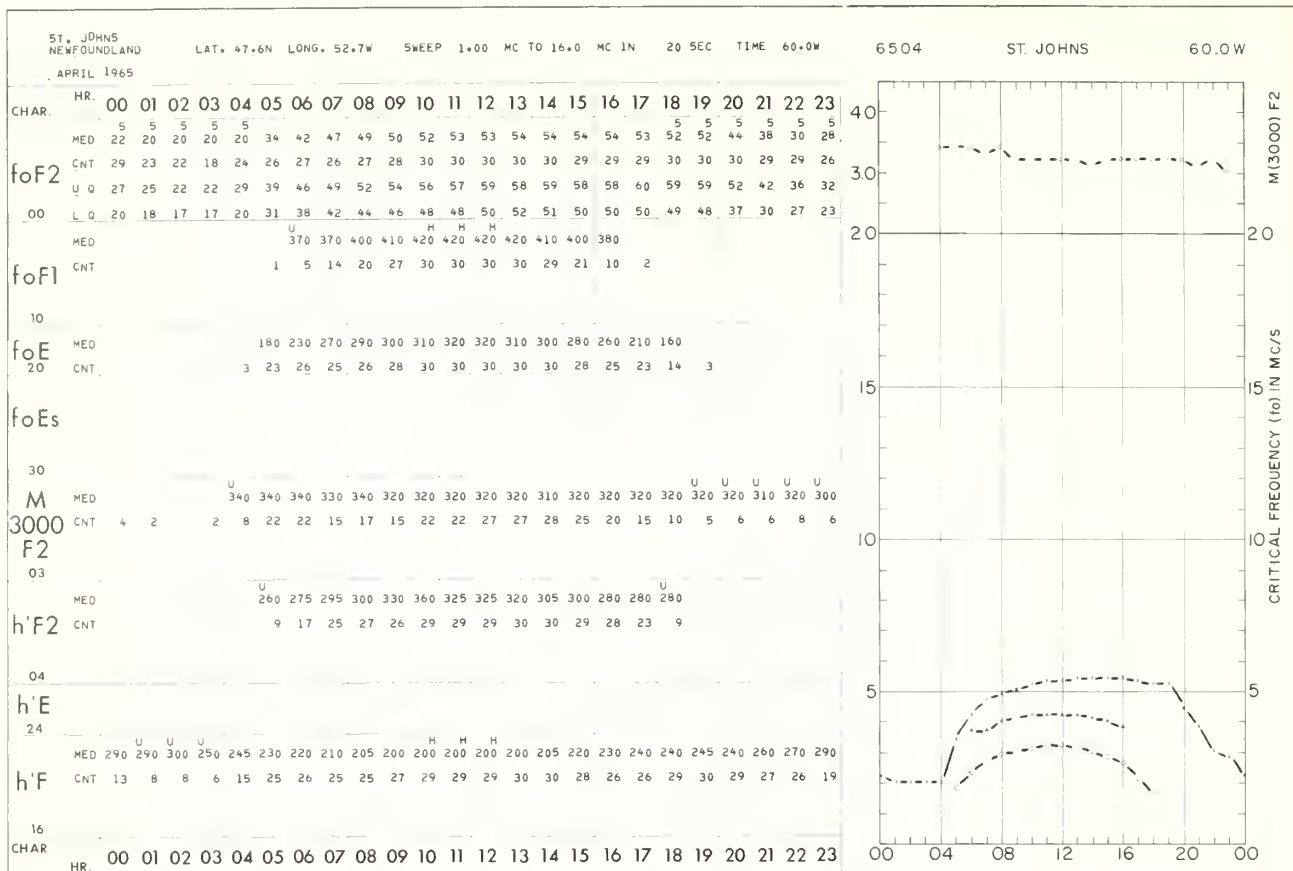
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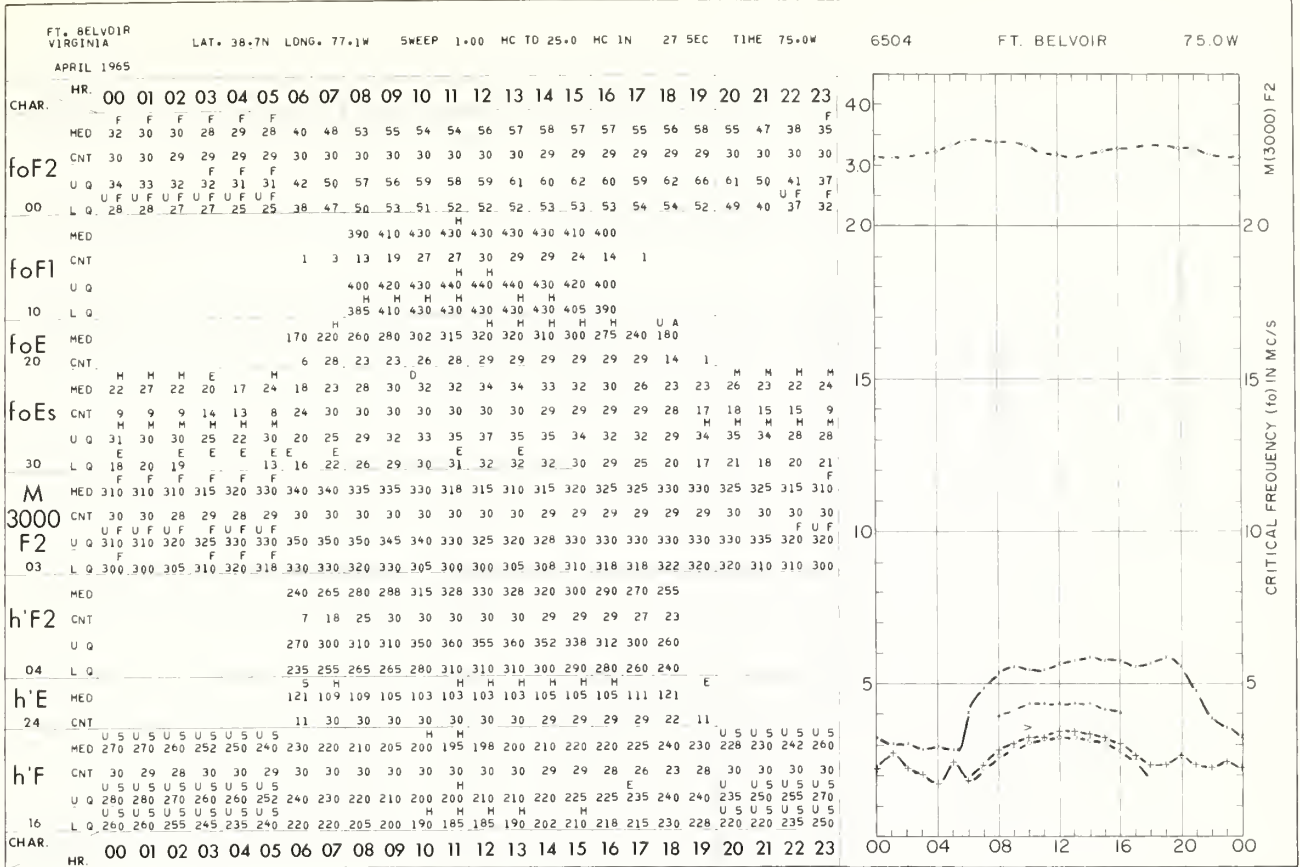
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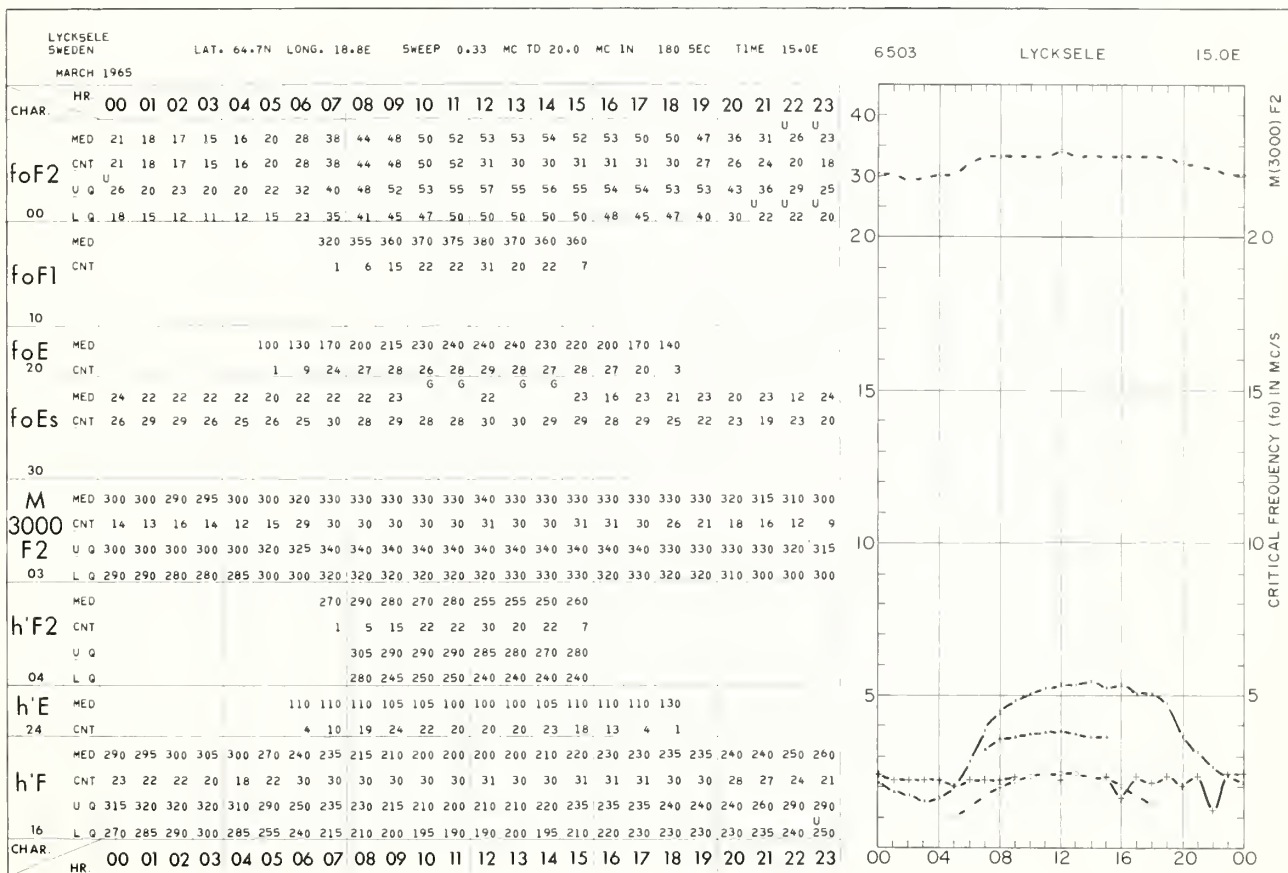
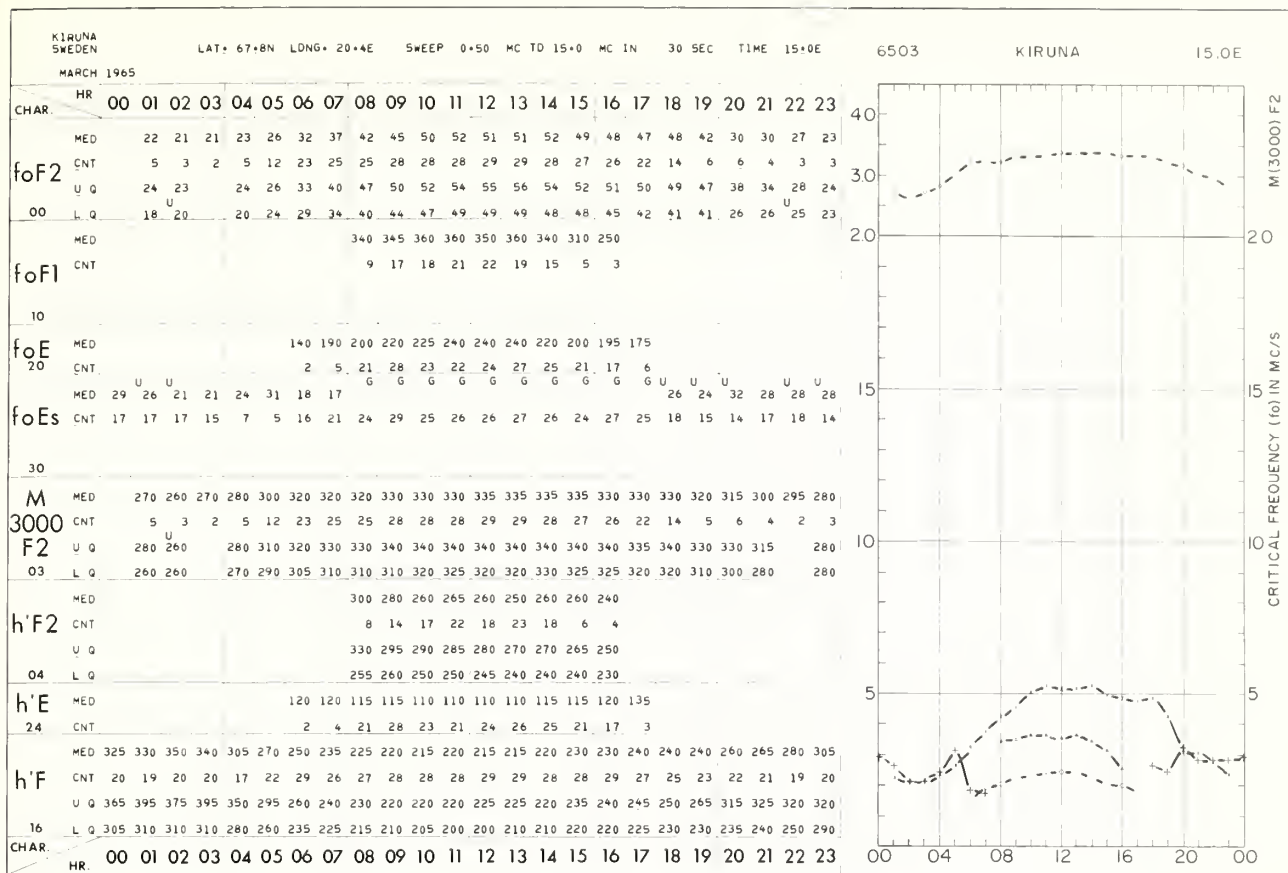
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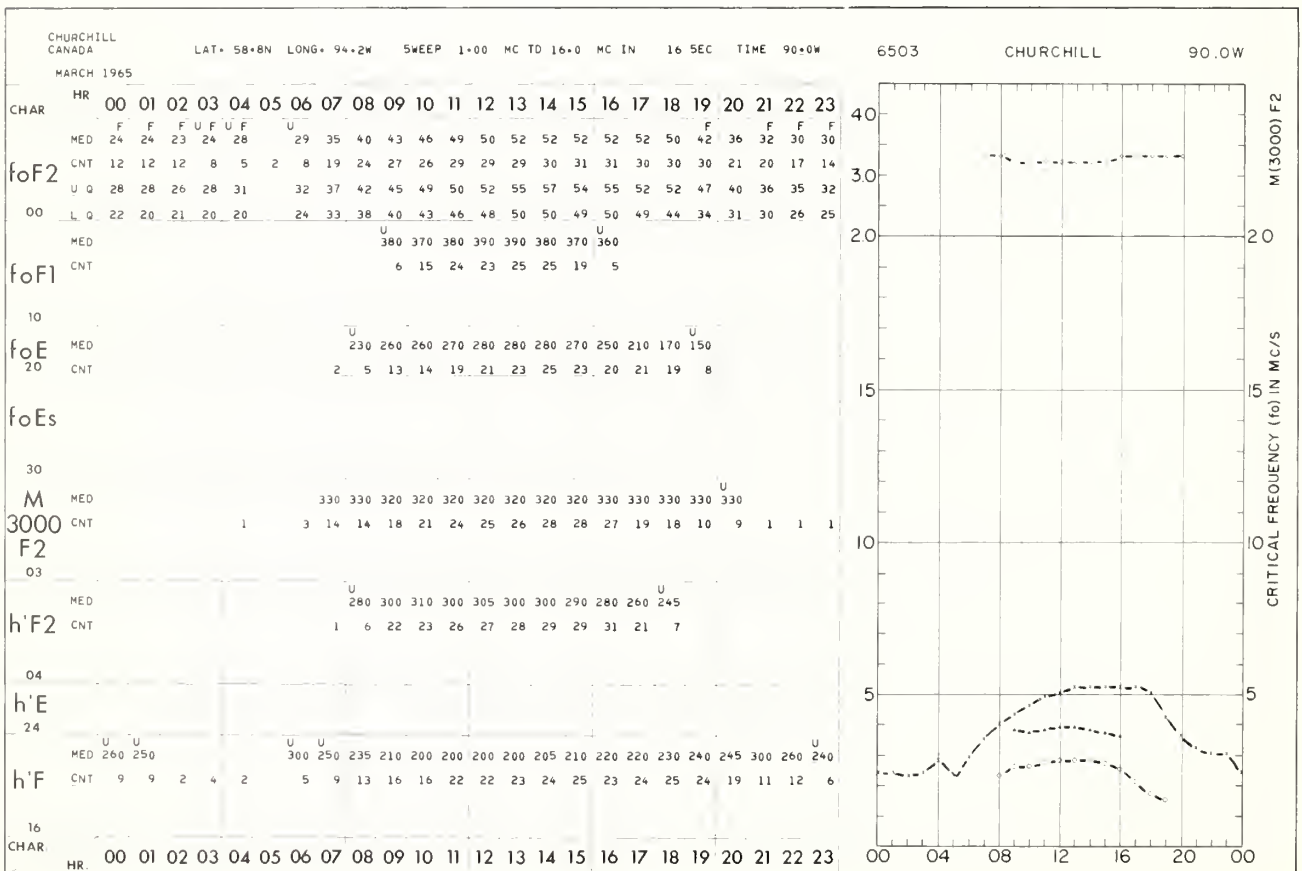
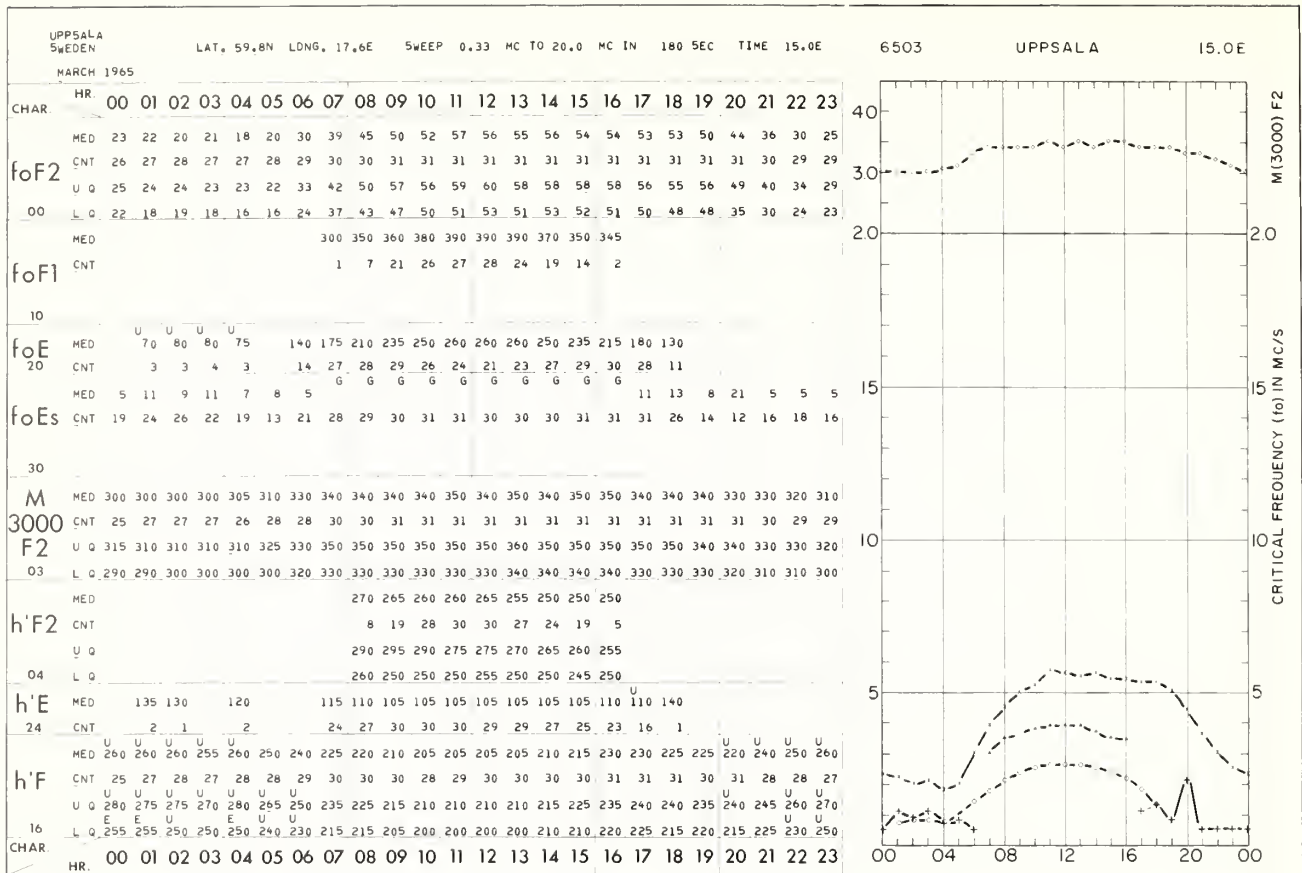
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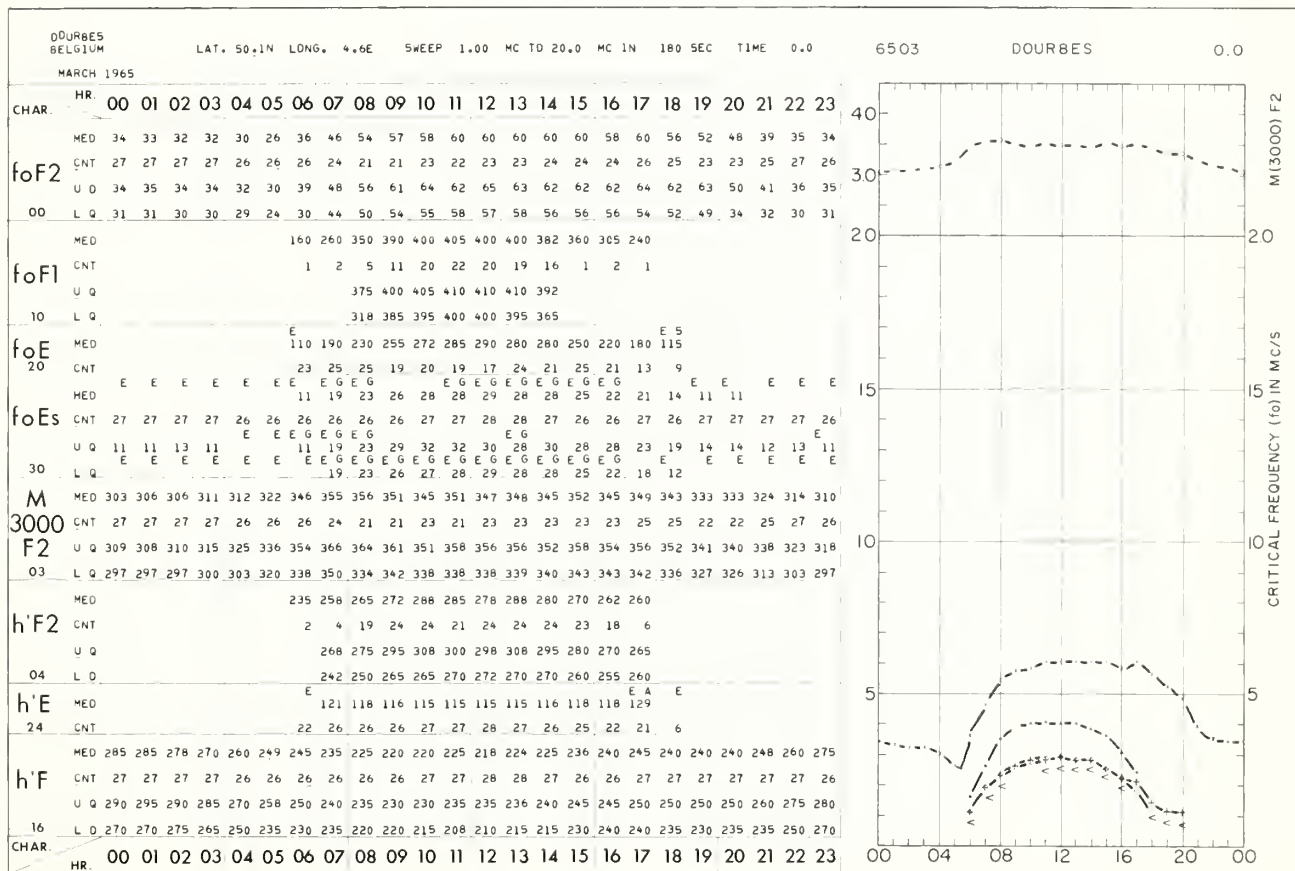
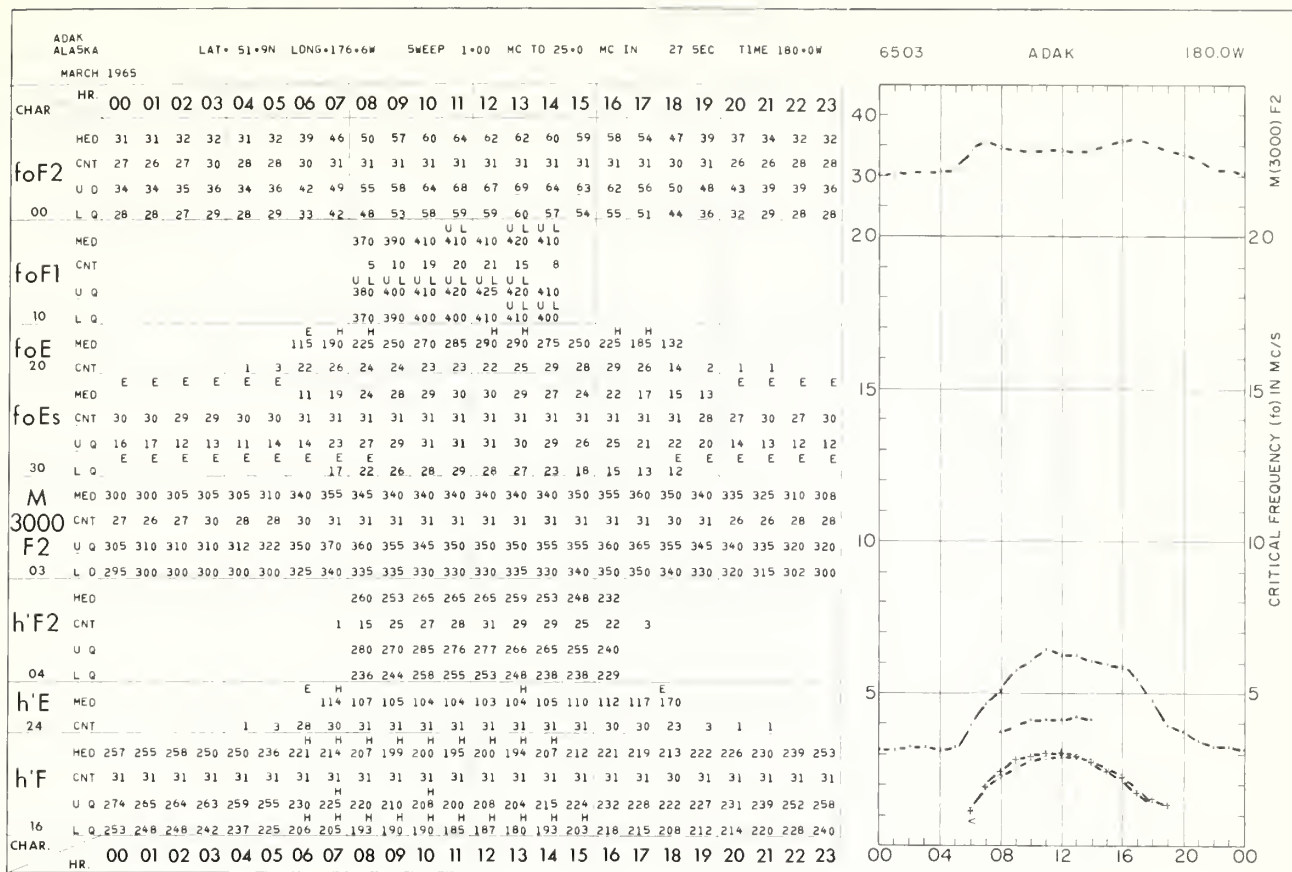
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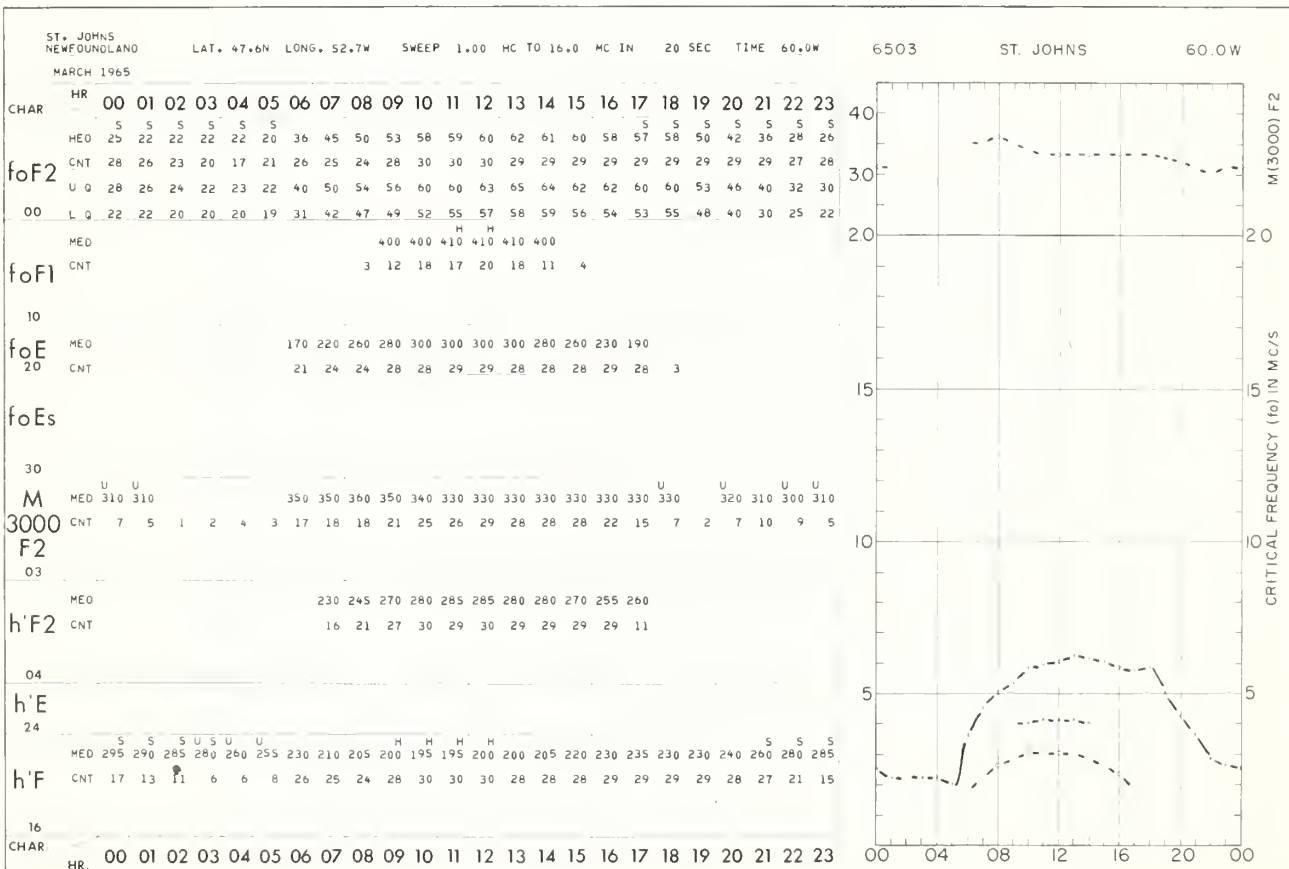
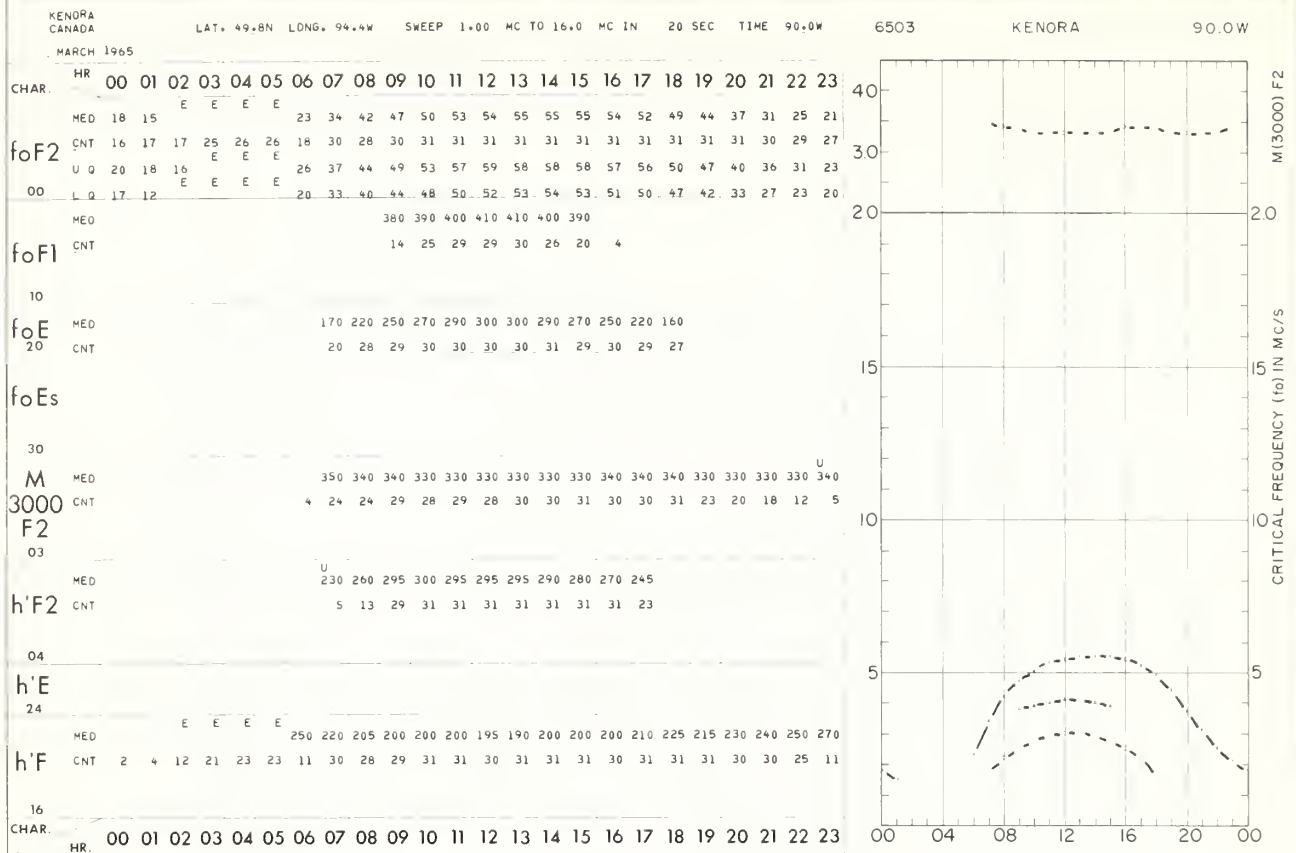
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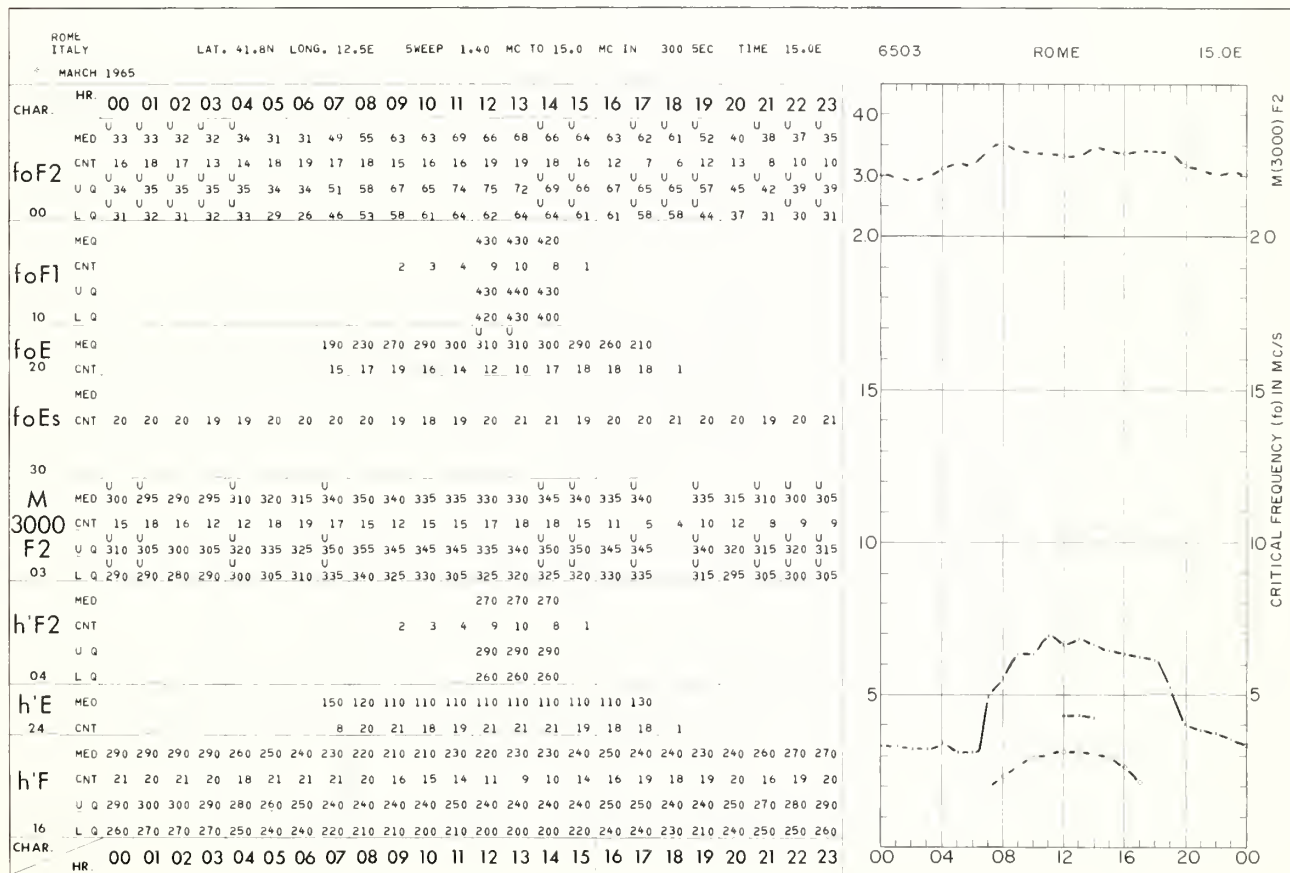
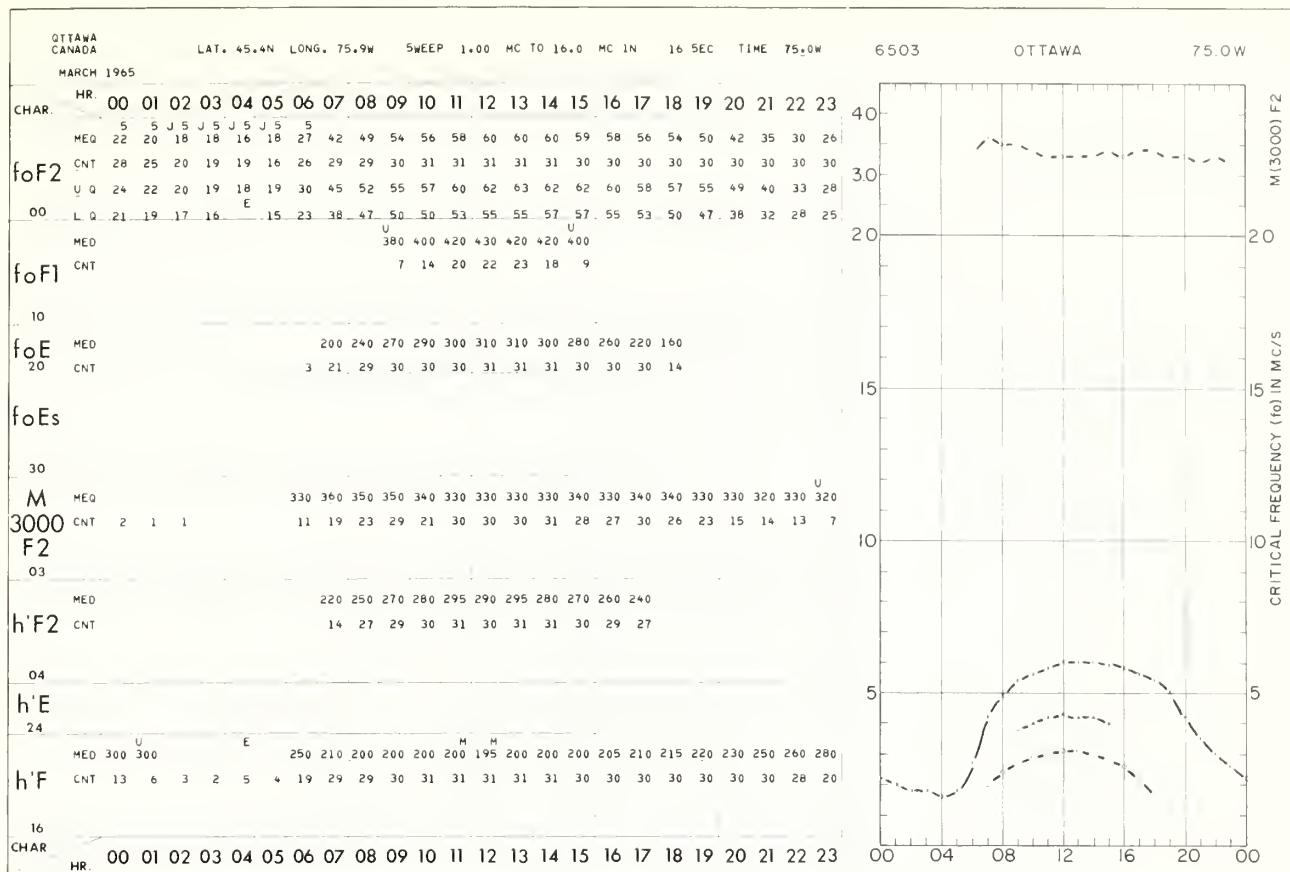
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foF ₂																								
MED			23	20	21	24	27	39	44	46	49	50	52	52	52	50	50	46	48	40				
CNT	4	4	10	10	11	14	20	21	19	22	23	21	22	25	25	26	22	16	8	7	1	3	3	2
U Q			23	22	24	28	32	40	47	50	55	56	56	56	54	53	49	51	46					
00 L Q			21	18	18	21	25	35	40	44	46	48	49	50	49	47	45	42	44	25				
MED										240	270	270	275	280	265	225								
foF ₁																								
CNT							1	2	1	7	6	5	6	8	5	7	3	1						
U Q										350	370	370	360	370	360	240								
10 L Q										225	245	255	260	250	240	225								
foE																								
MEO							155	175	185	205	220	230	240	235	230	215	200	180	180					
20 CNT							2	5	13	16	18	17	17	19	20	18	20	14	5	4				
MED							G	G	G	G	G	G	G	G	G	G								
foEs																								
CNT			32	34	25	26	27	23	18	12							15	32	32	32	36	32	32	
U Q			30	16	18	13	13	11	13	16	17	20	19	17	17	20	21	24	25	19	17	19	20	22
30 U Q			38	48	32	32	31	28	26	22	22	20	22	18	16	18	31	34	40	36	44	41	40	
03 L Q			31	30	30	19	26	12	10															
M																								
3000 MED							275			300	305	325	330	325	330	335	335	335	335	325	315	310		
F2 CNT			1	2	5	2	4	8	14	21	19	21	23	21	22	25	25	24	18	14	5	5	2	2
U Q							290			310	320	335	335	335	340	340	345	340	345	335	320	320		
03 L Q							270			290	300	315	320	320	320	320	325	325	325	335	310	310	300	
h'F ₂																								
MEO										250			240	250	240	230	240	255	240	240				
CNT										1	5	3	14	16	15	13	14							

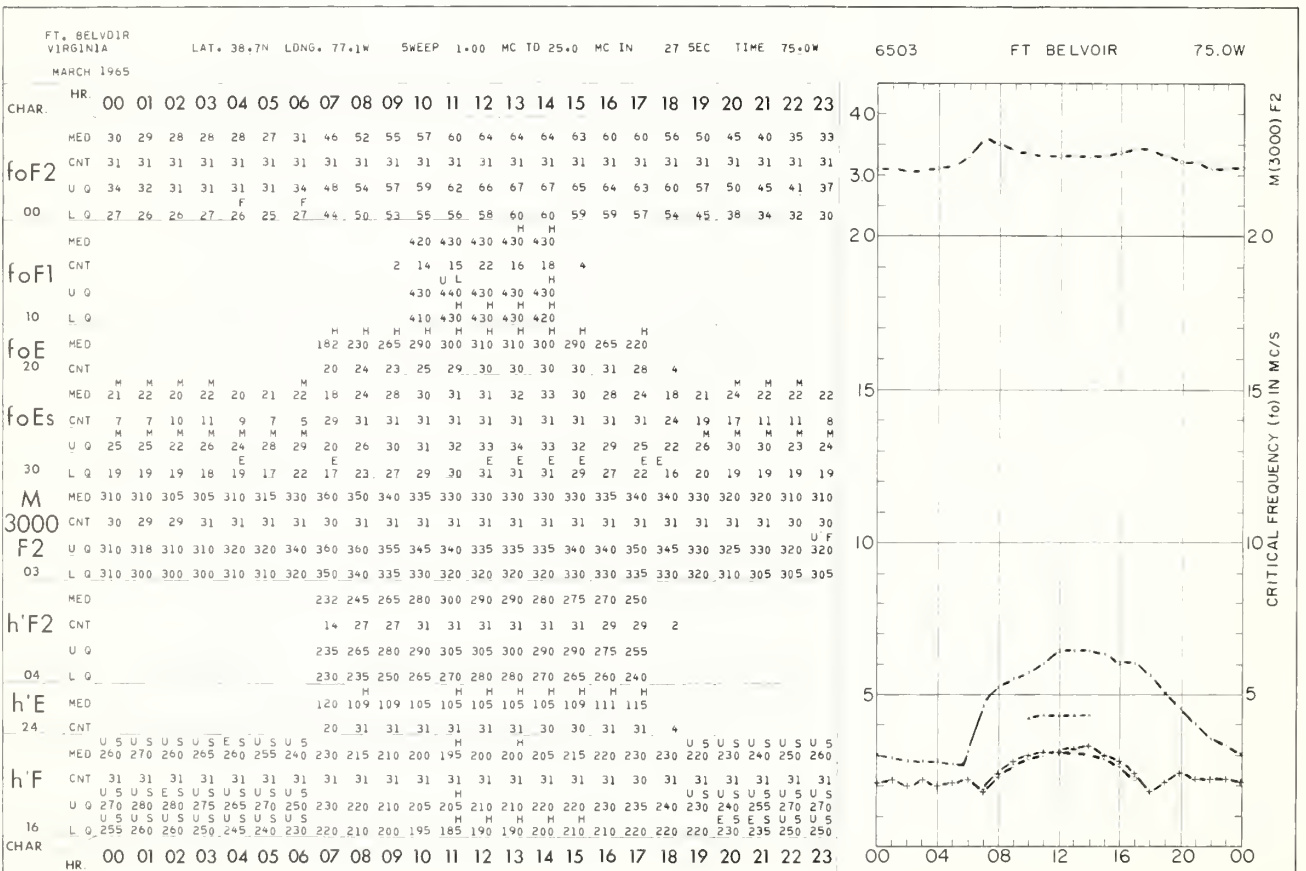
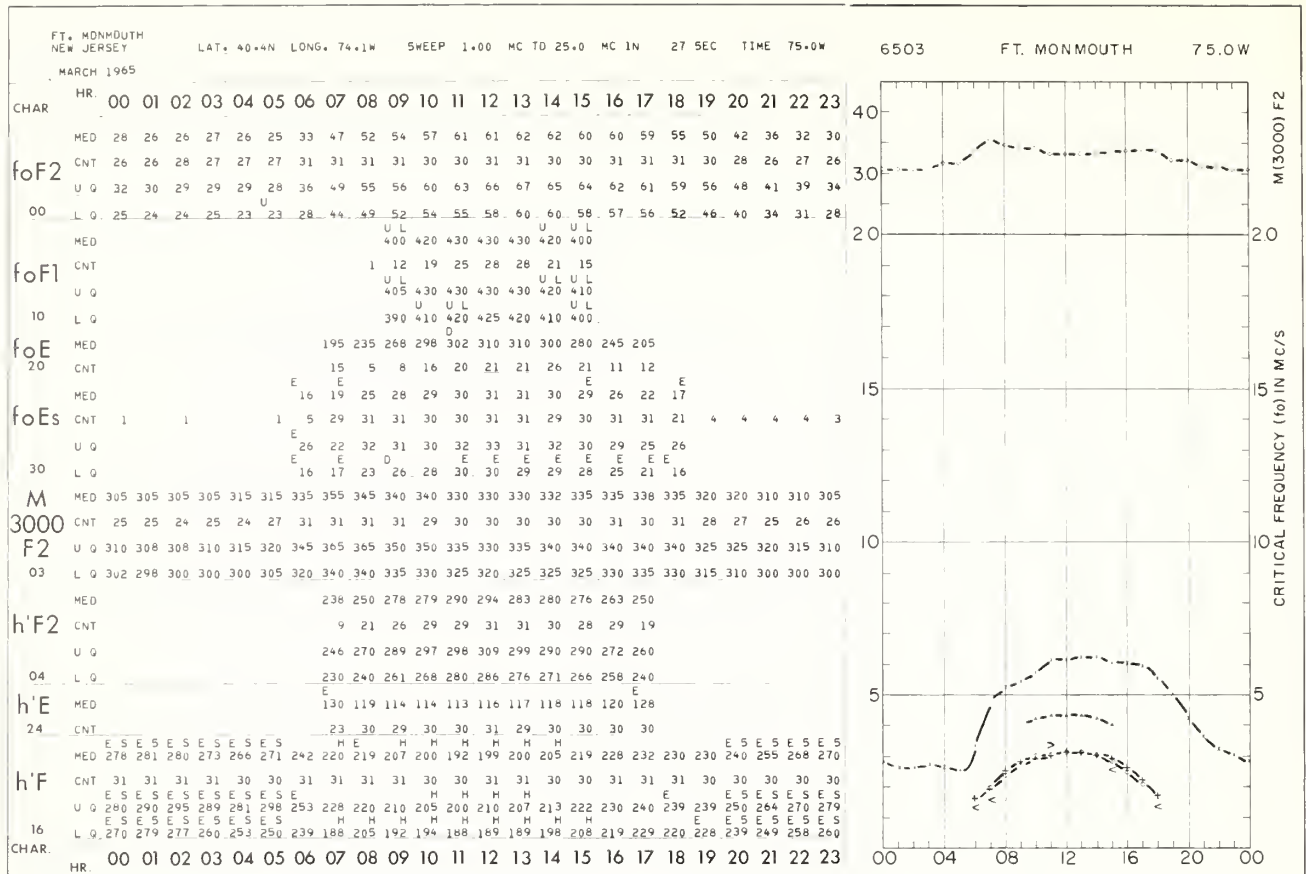


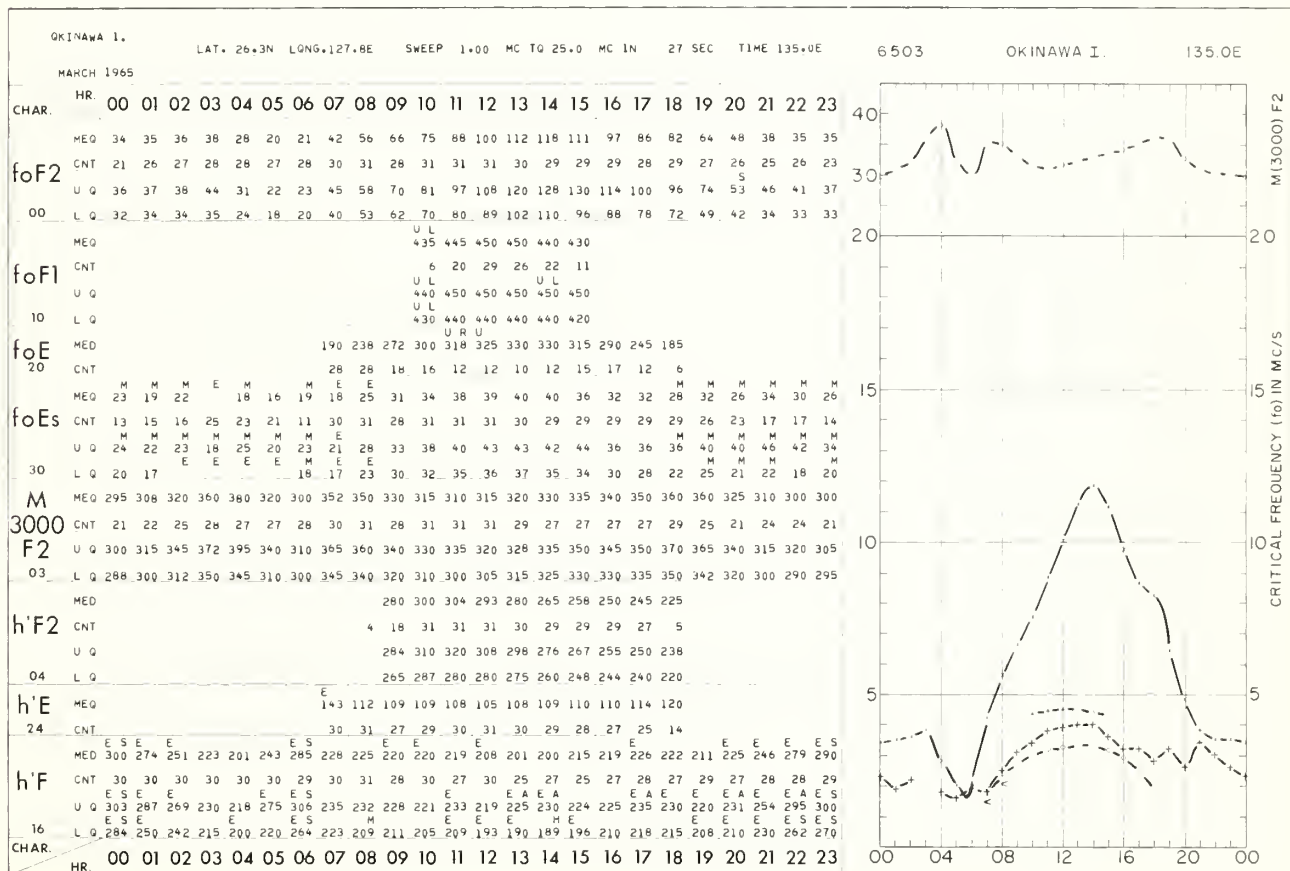
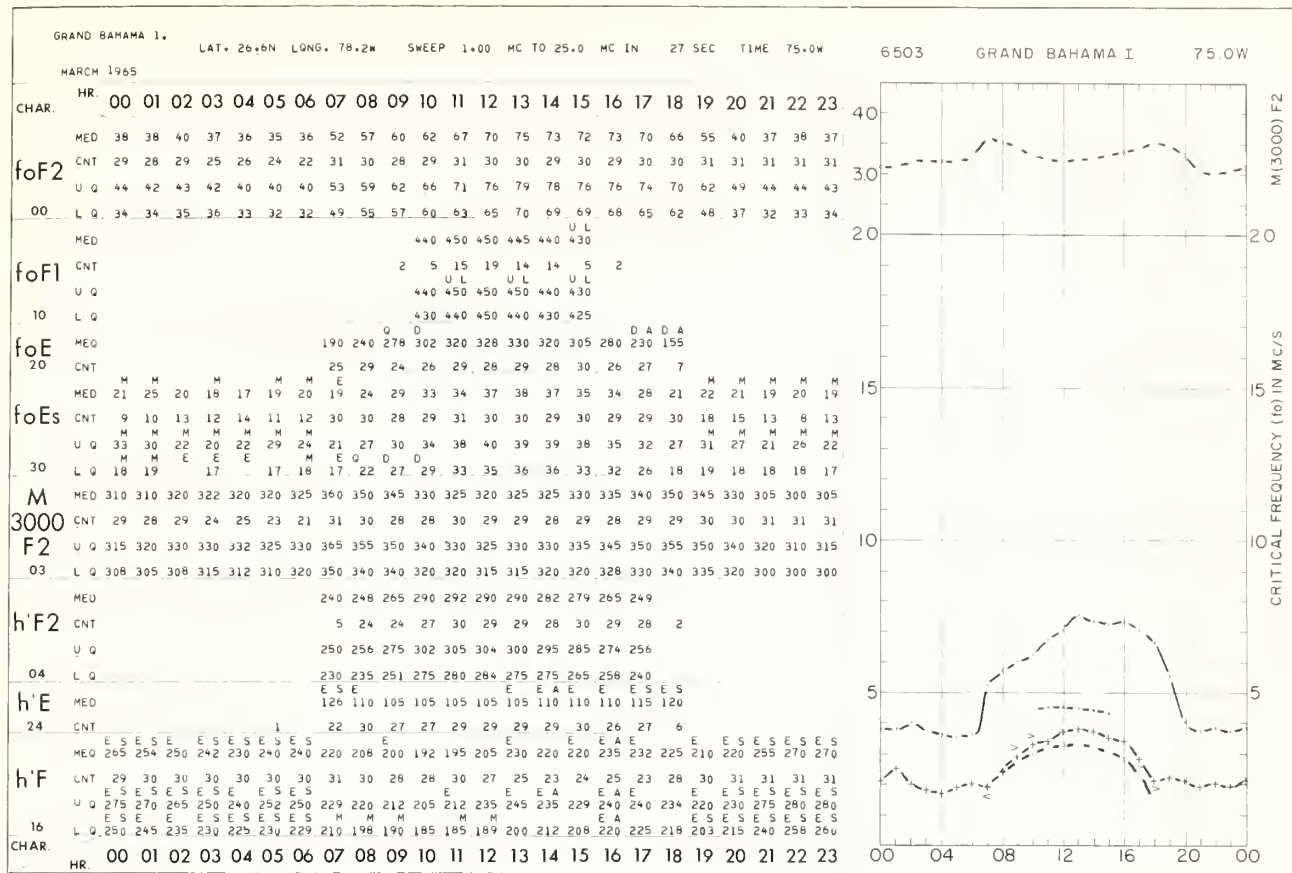


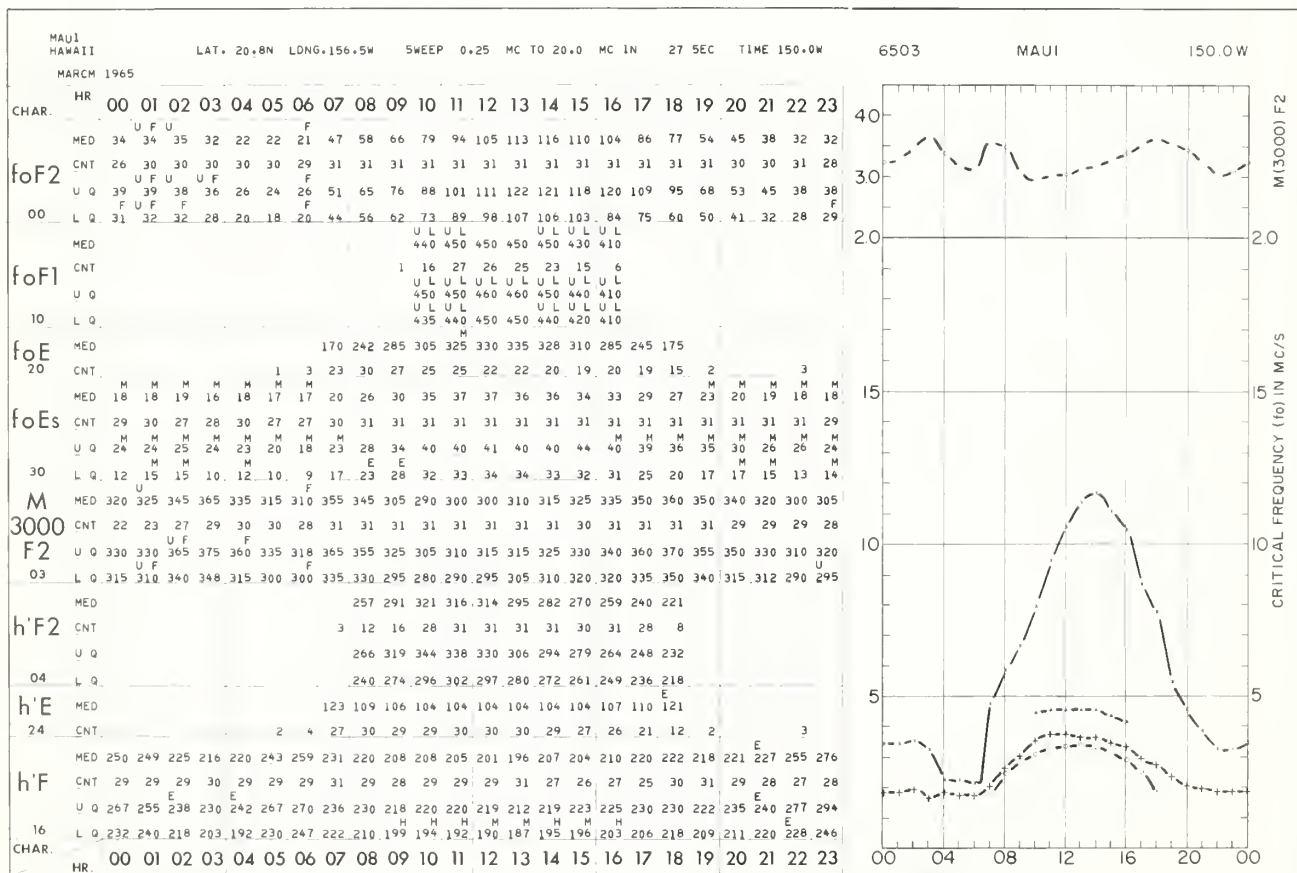
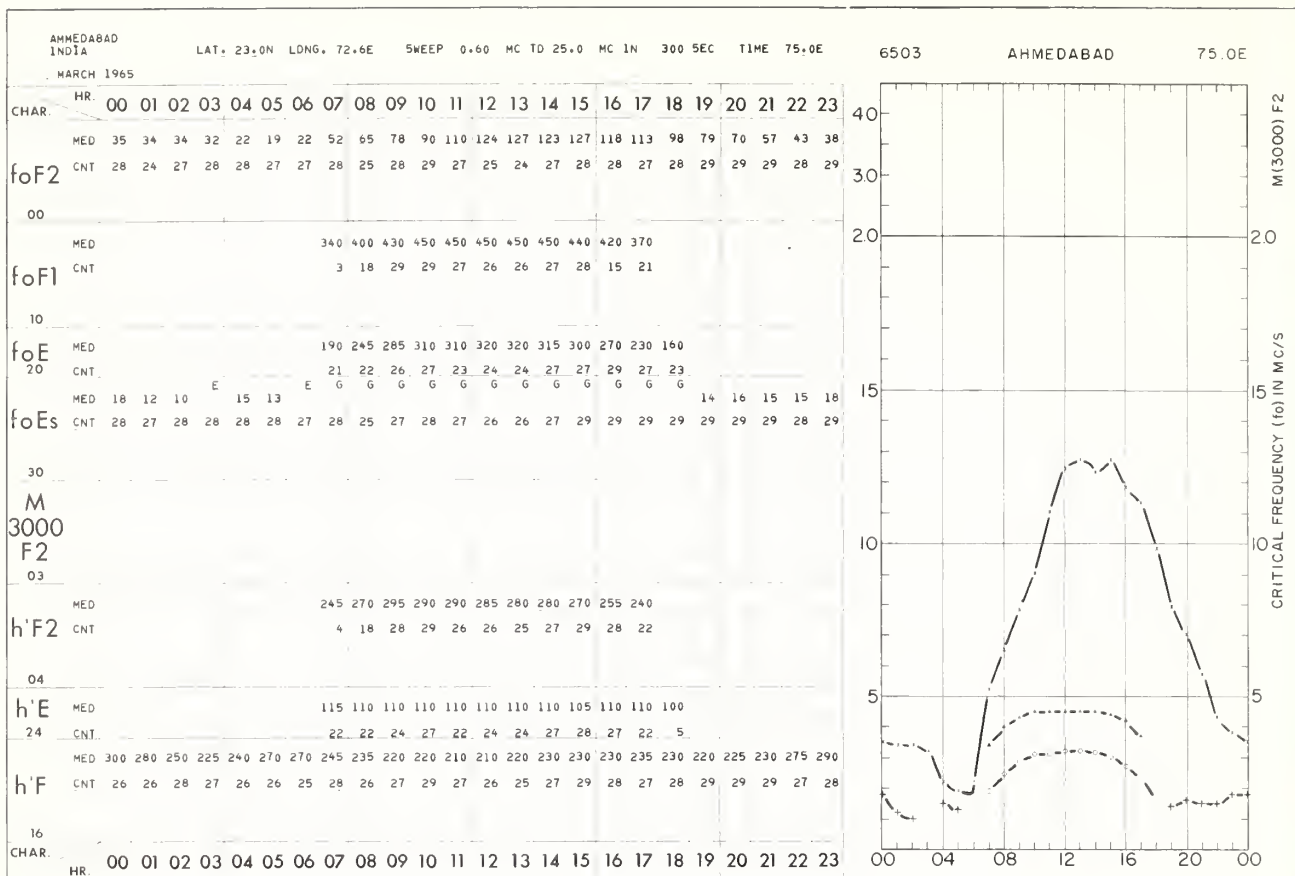


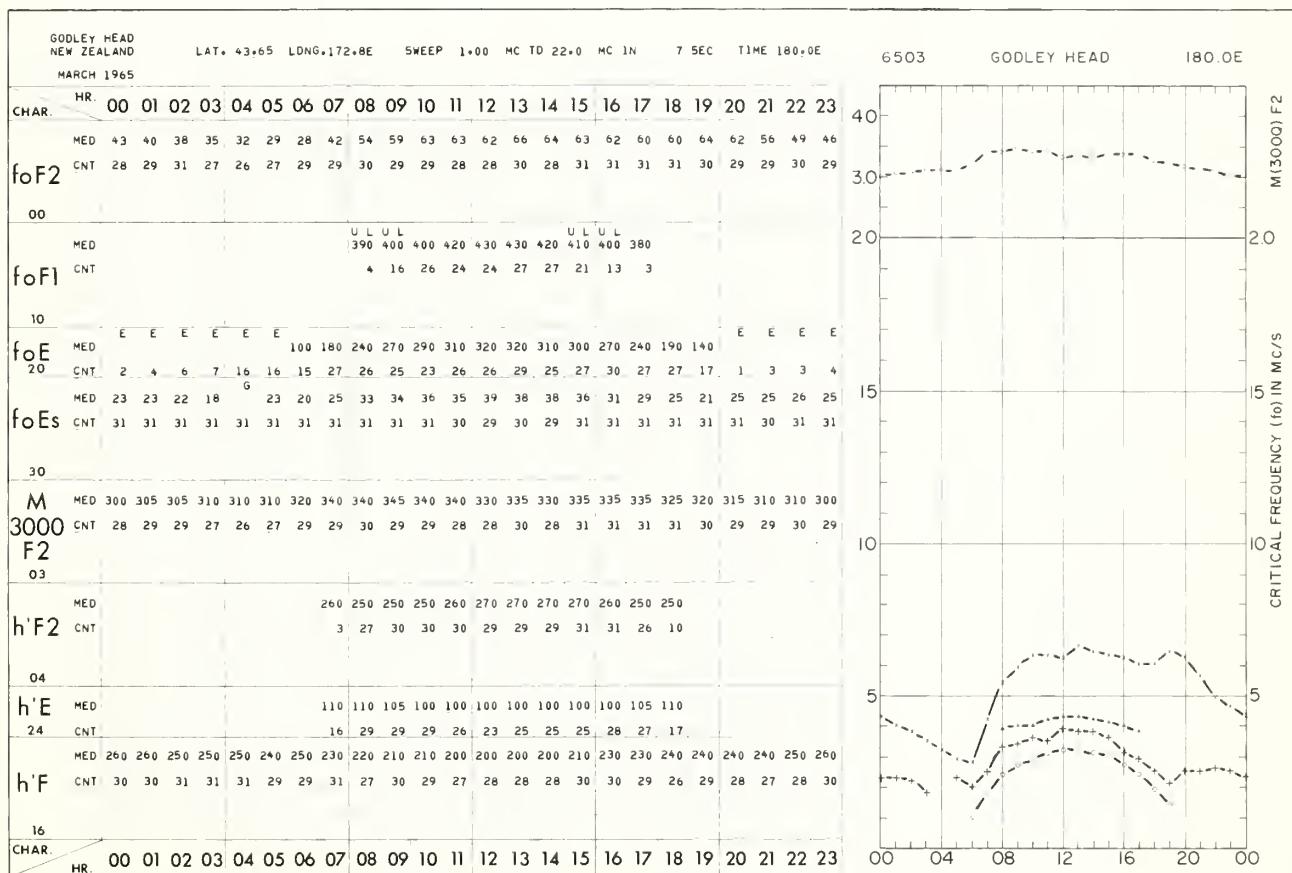
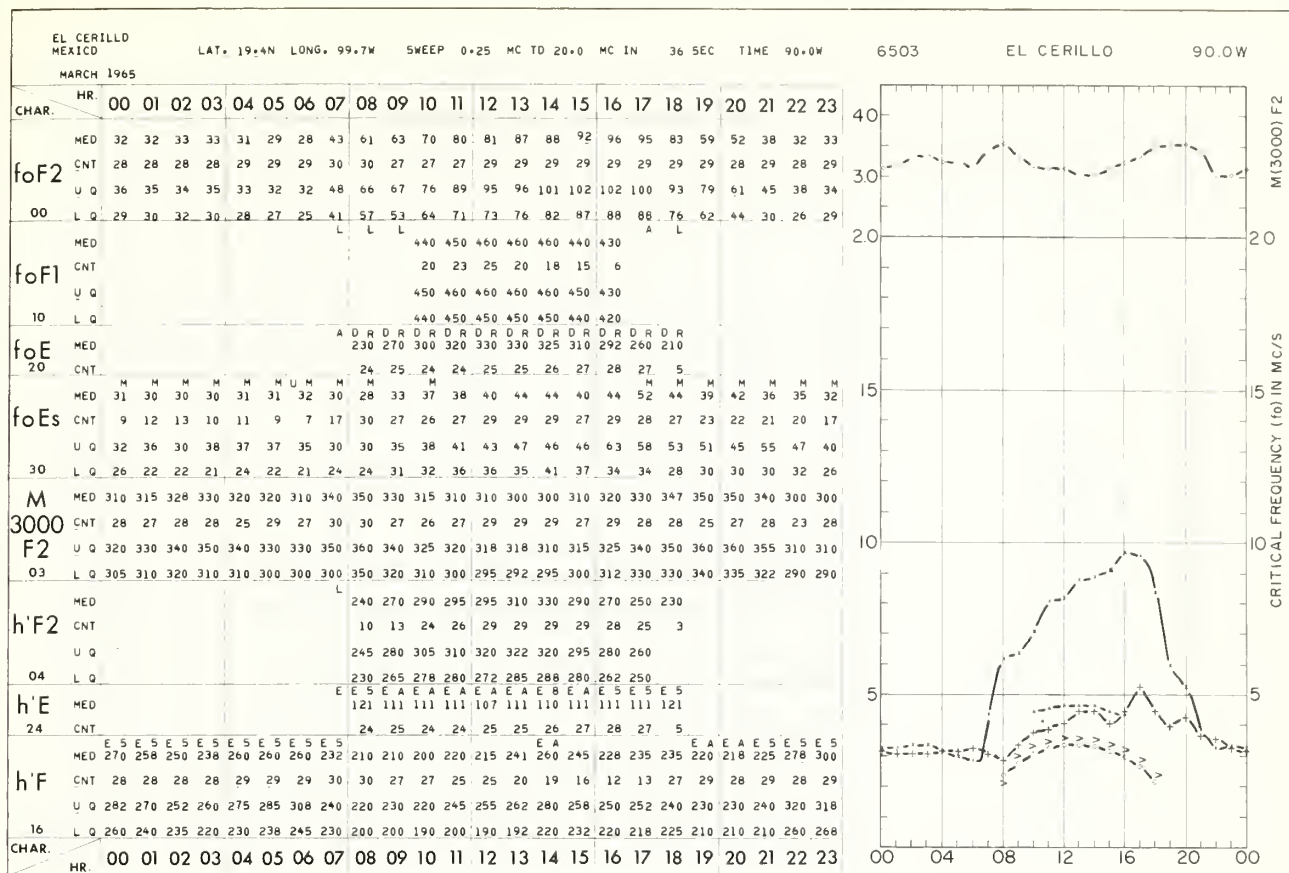


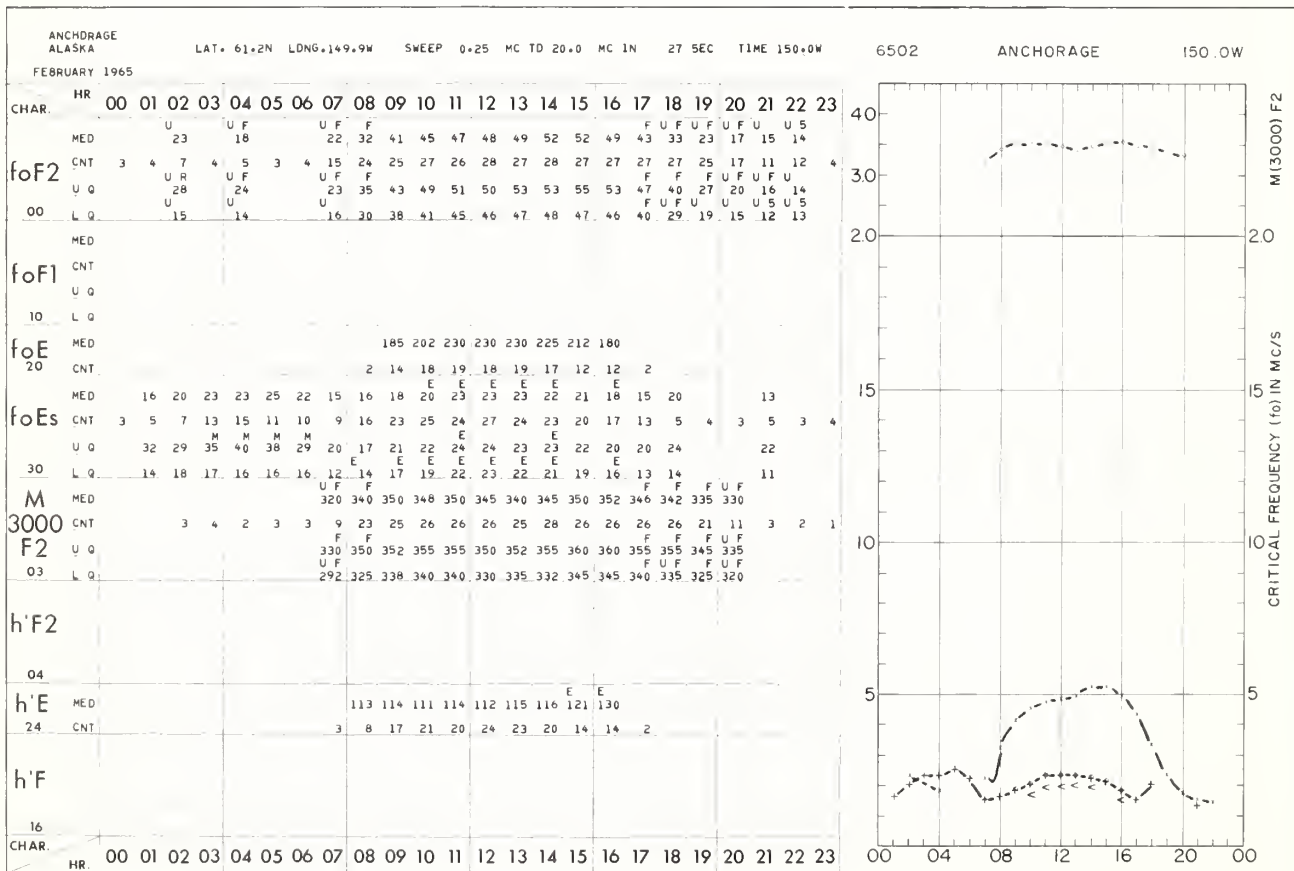
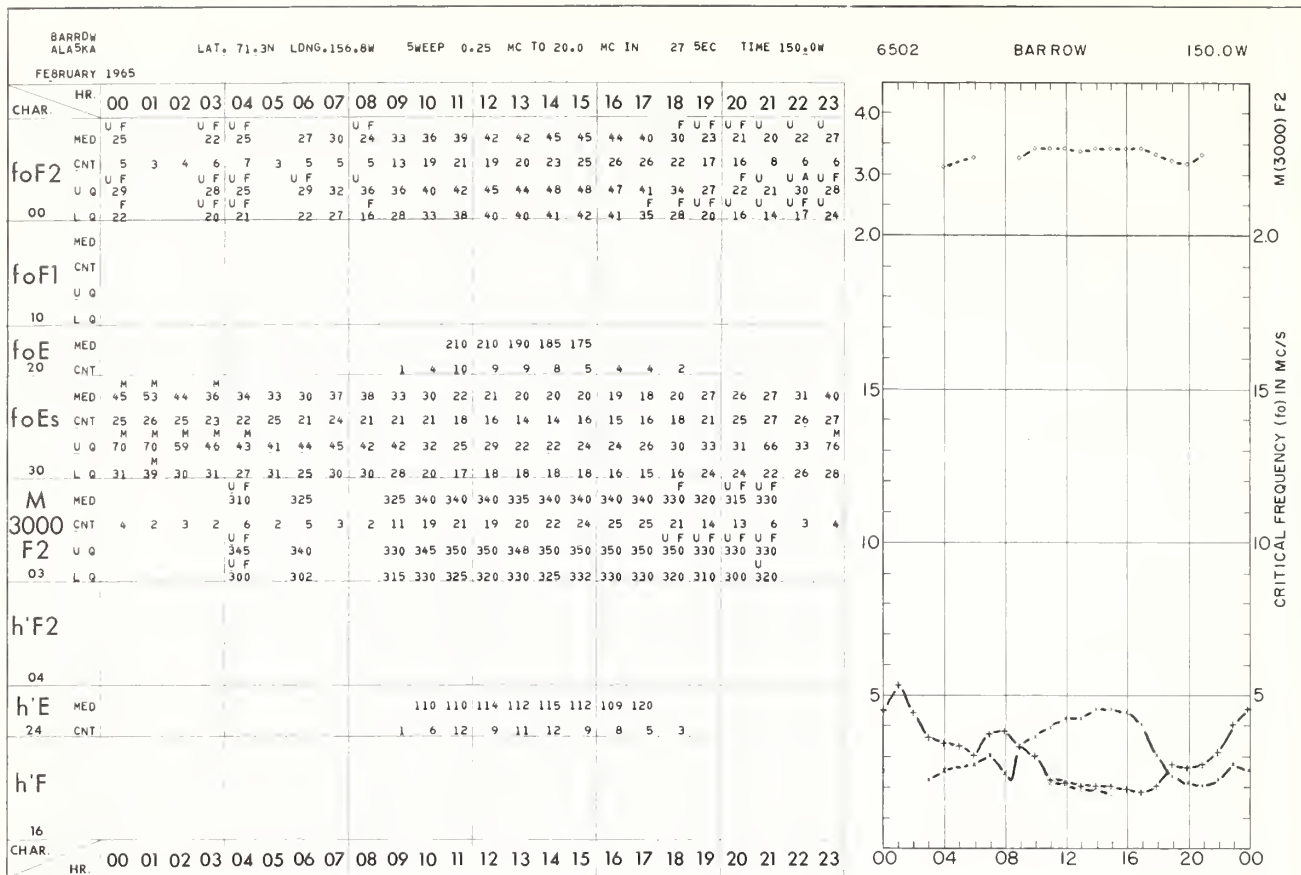


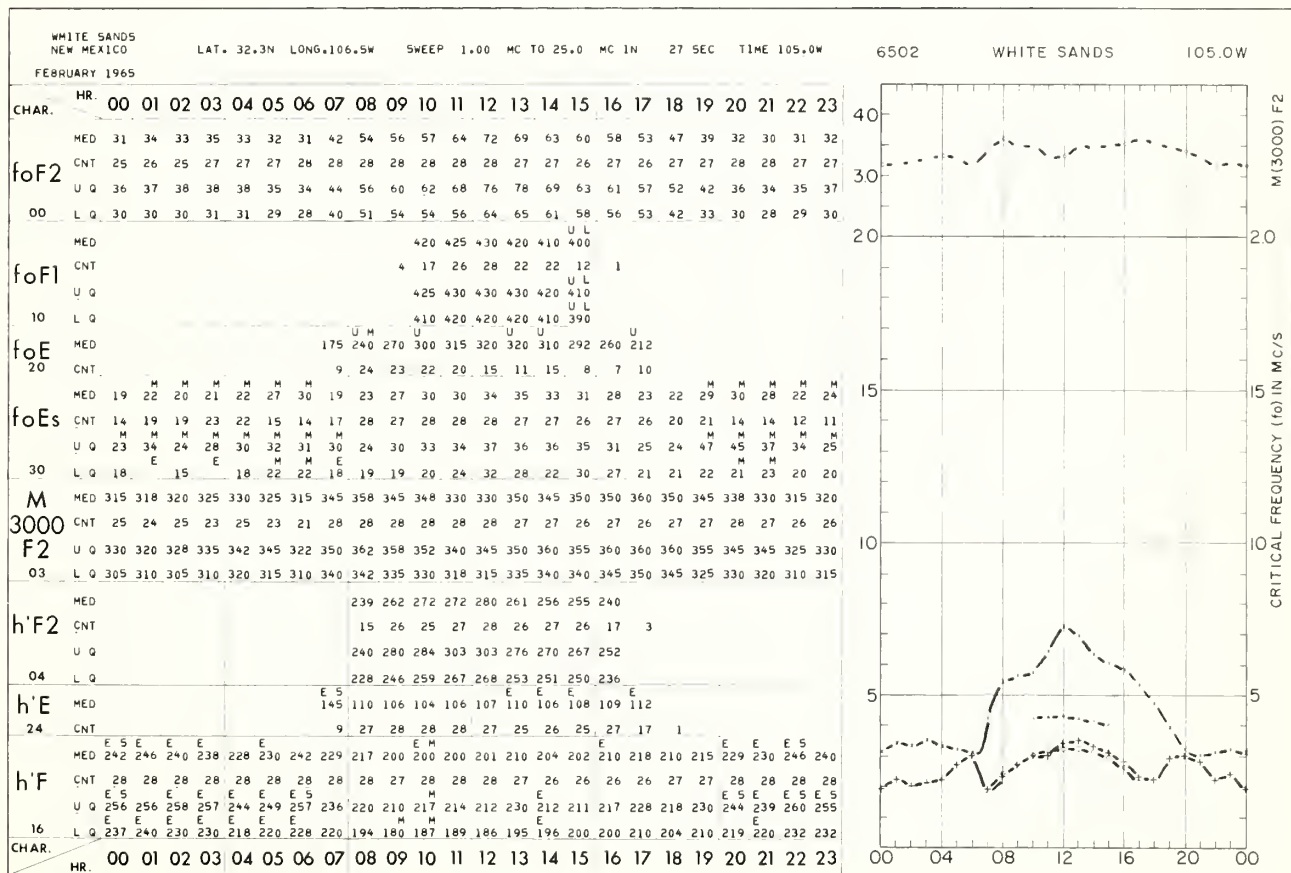
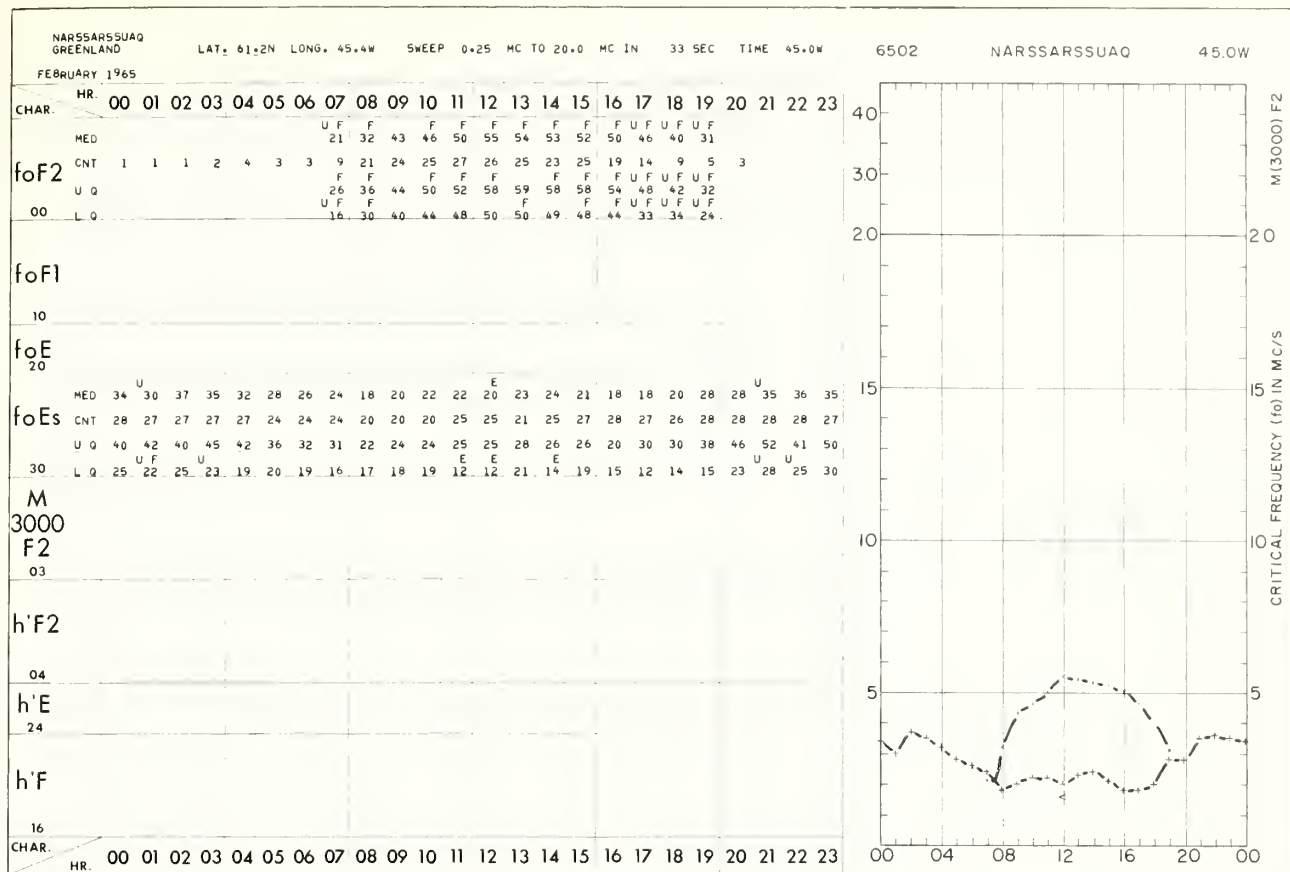


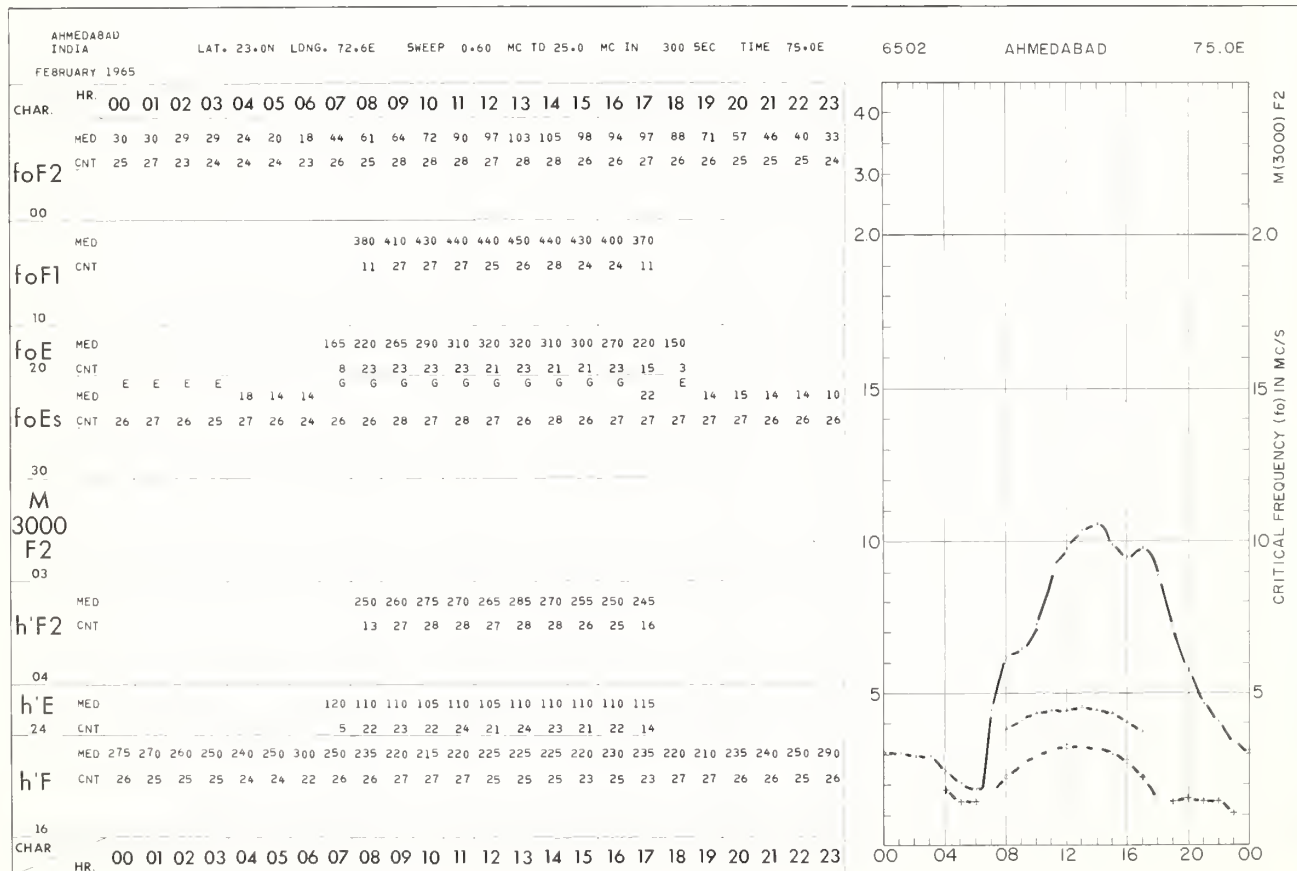
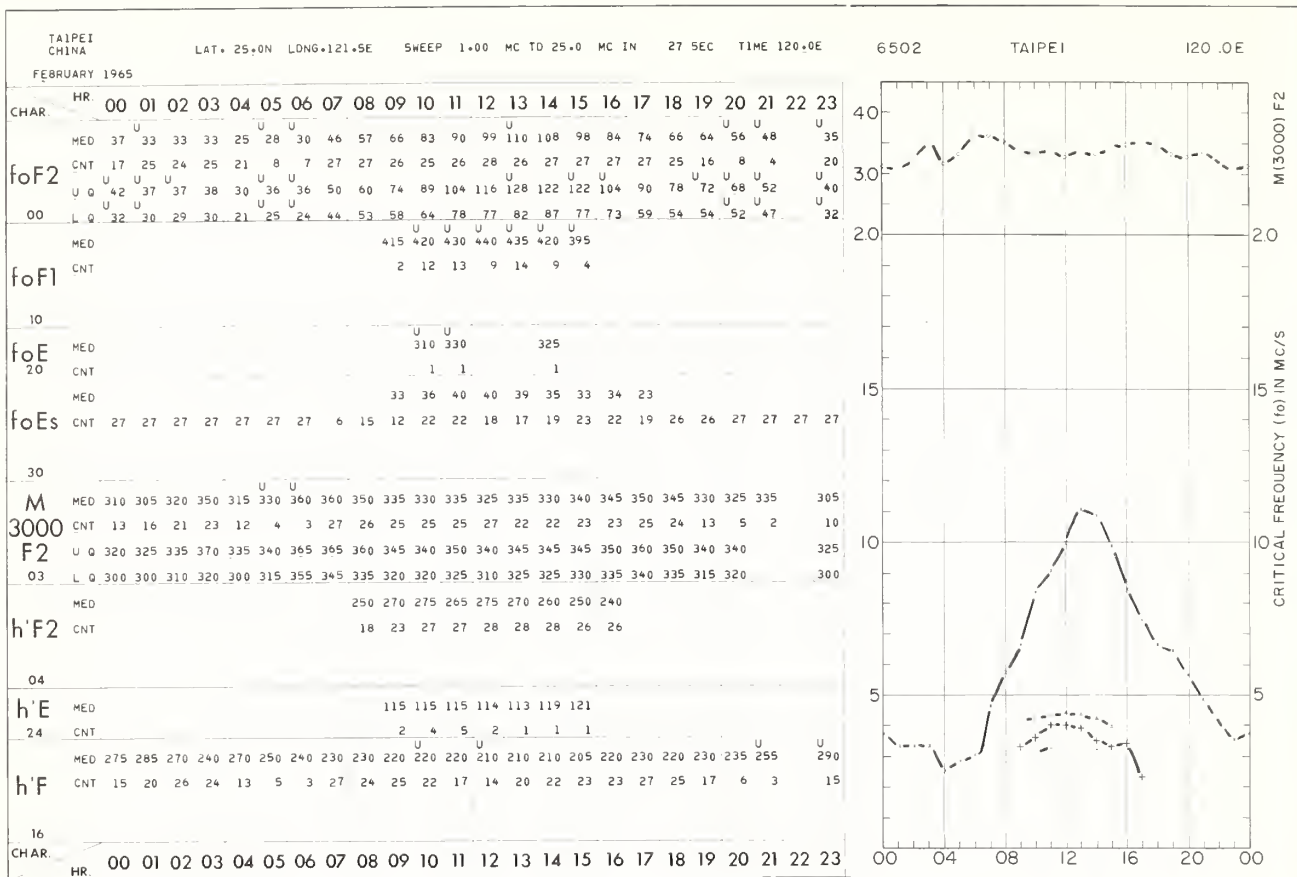


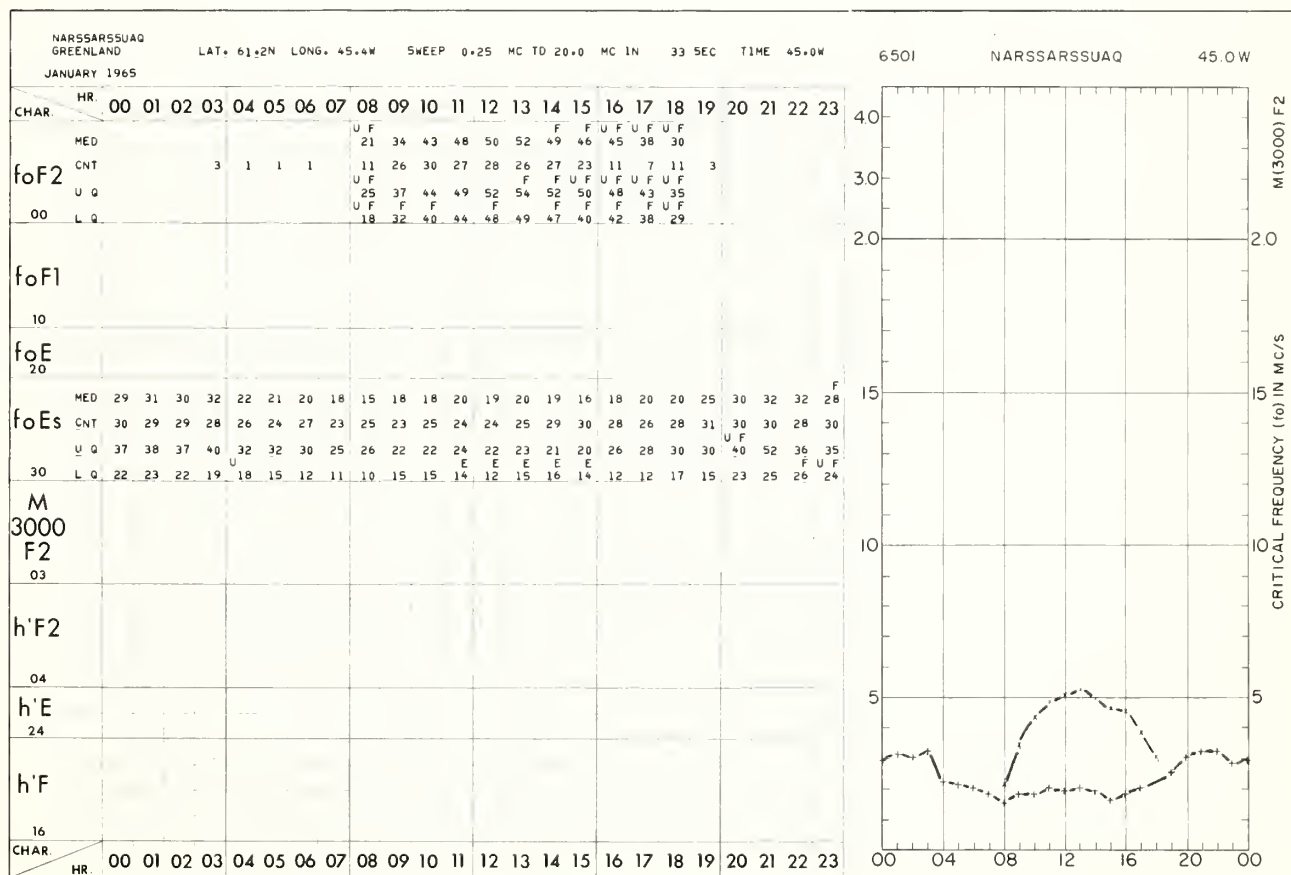
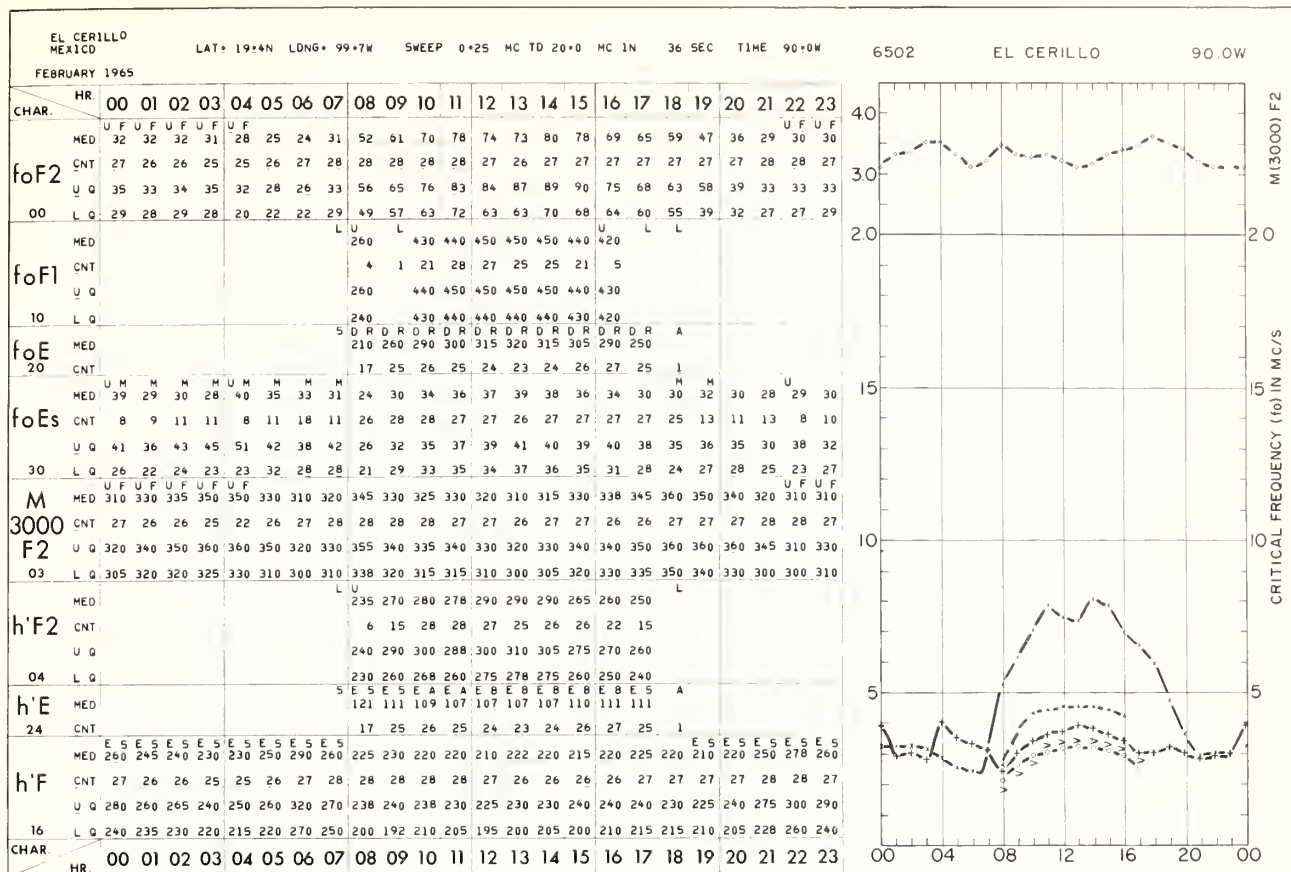


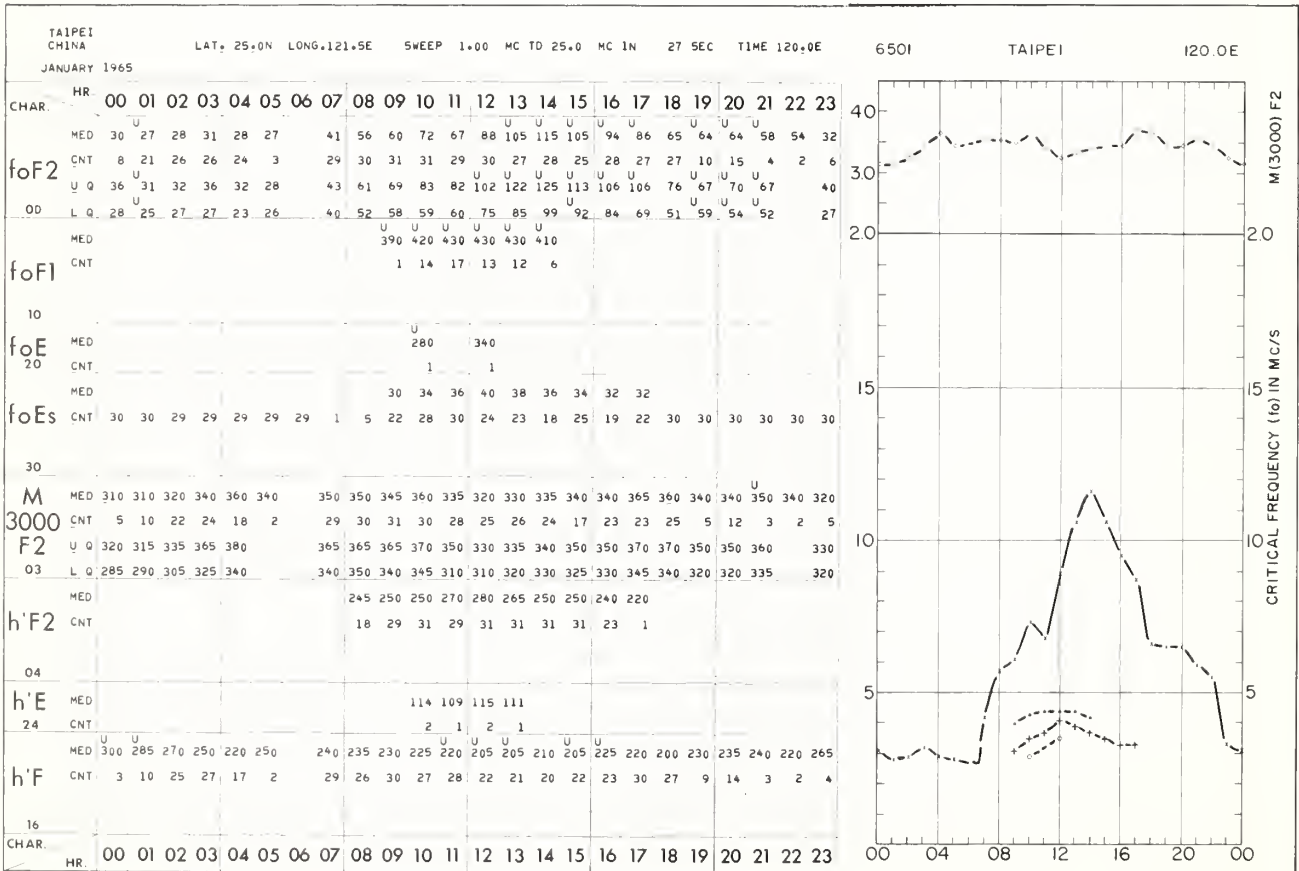
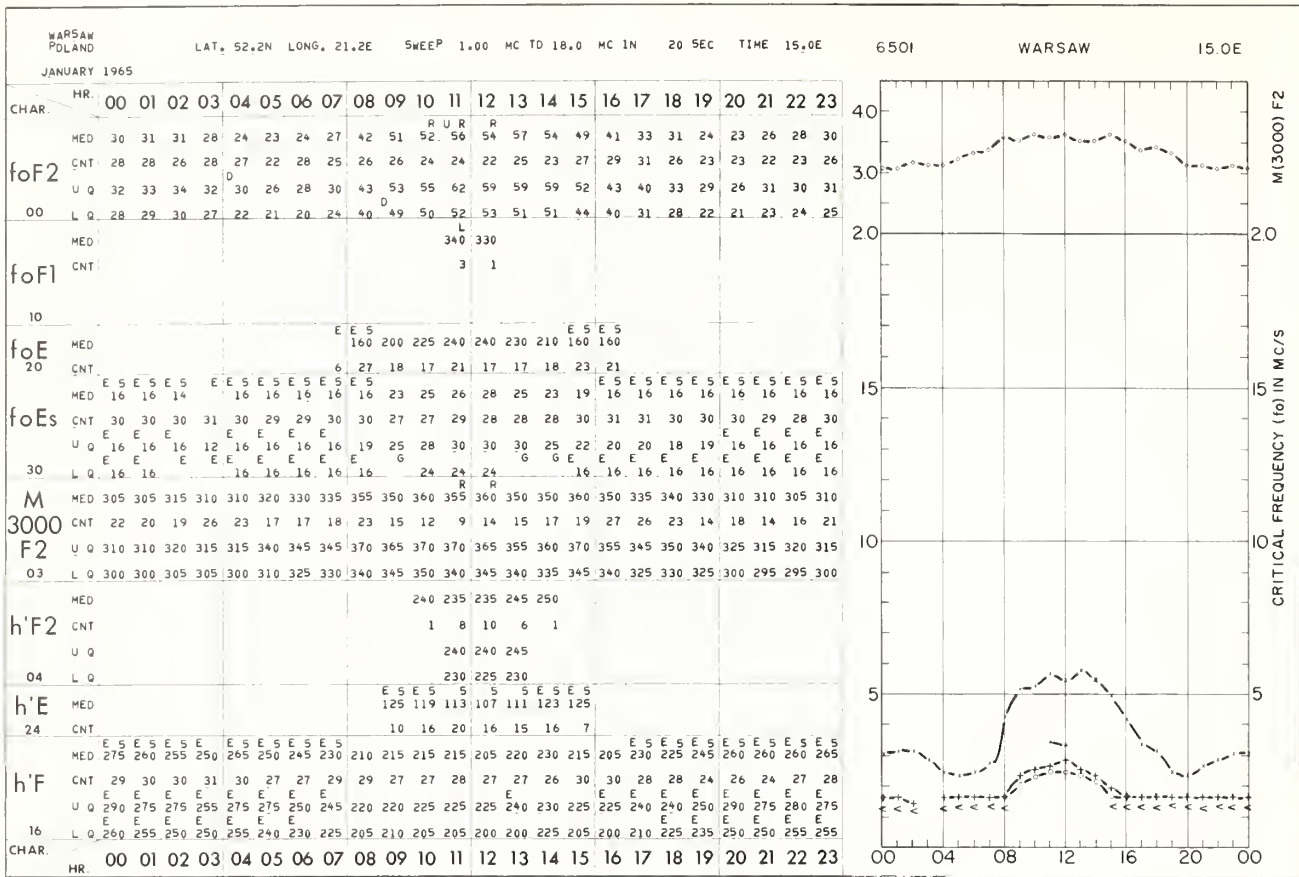


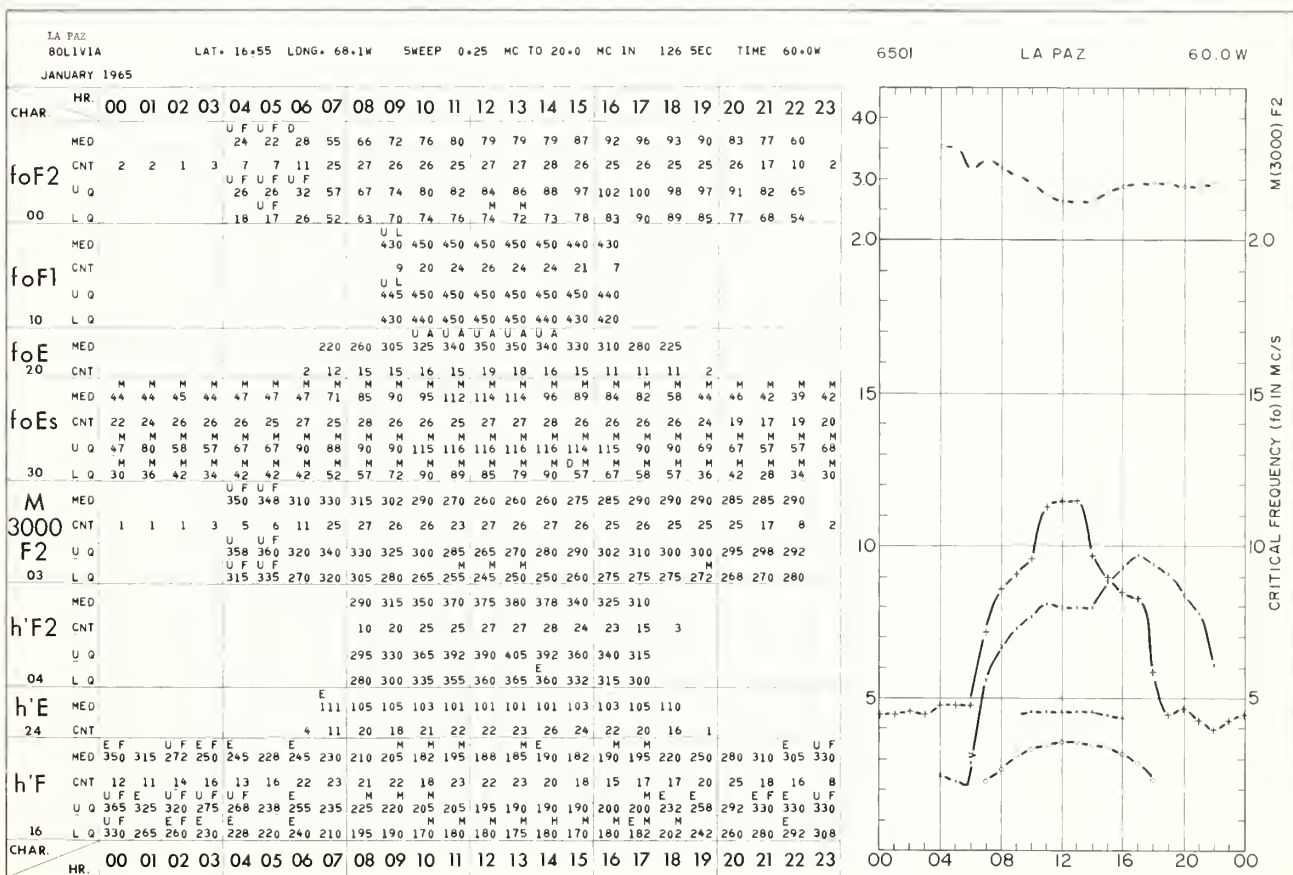
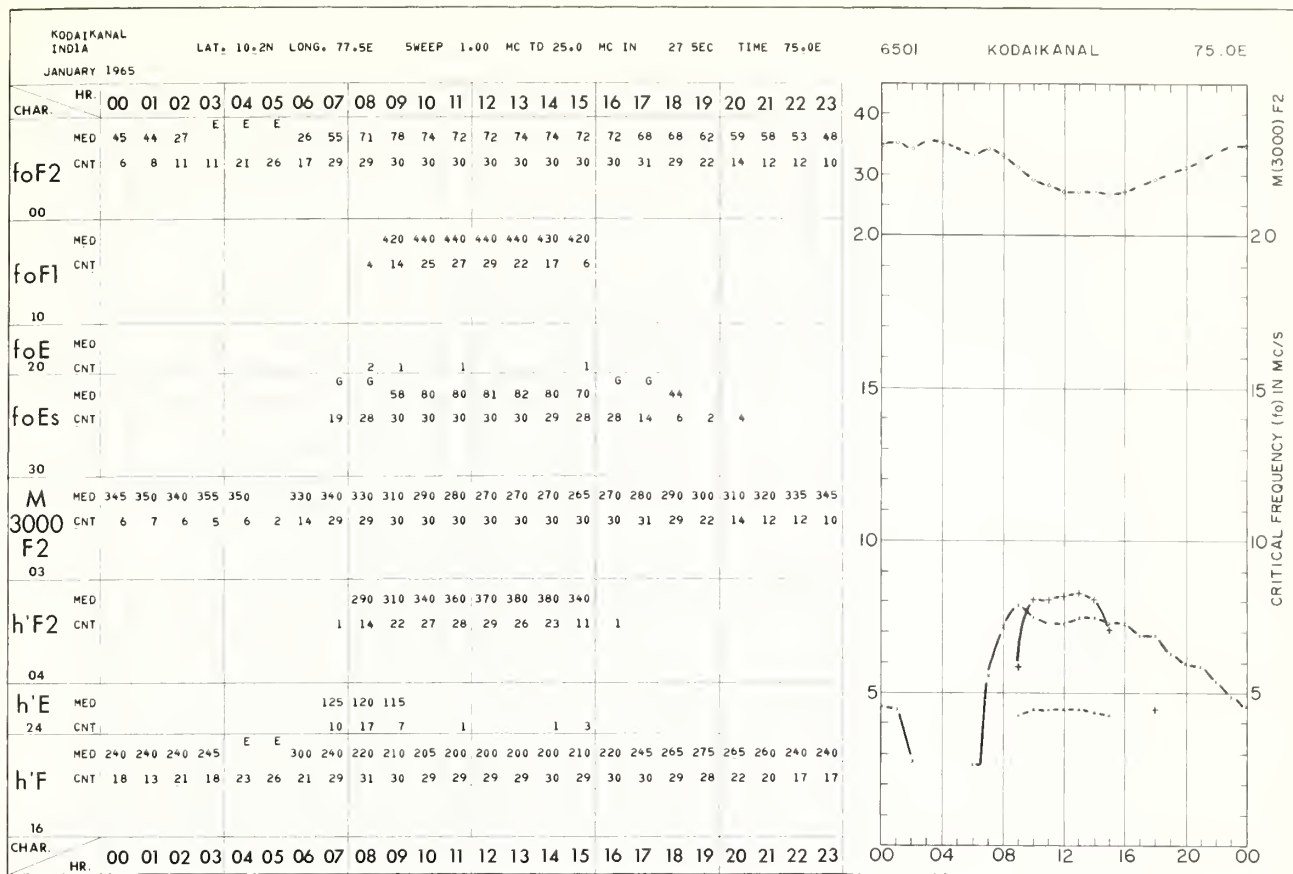


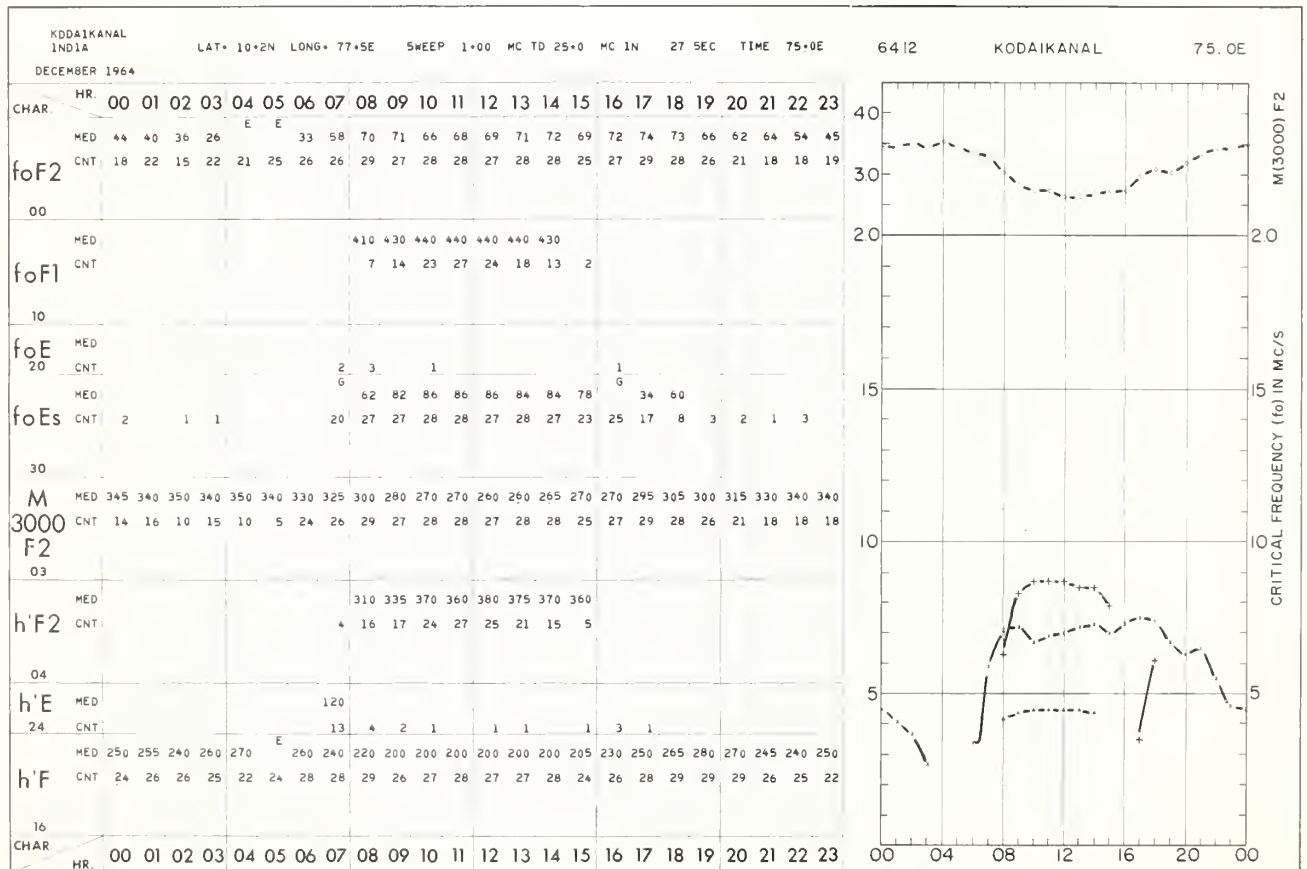
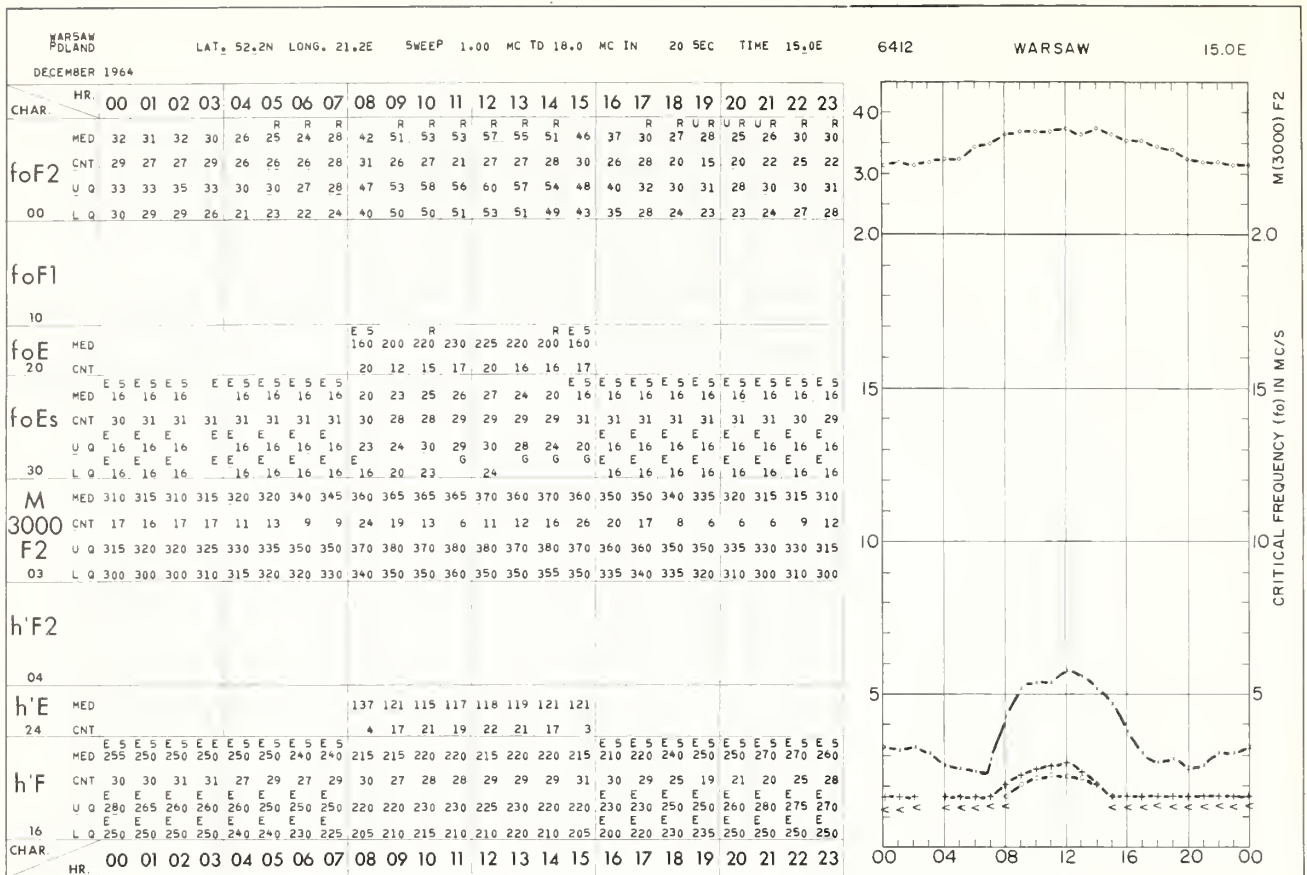


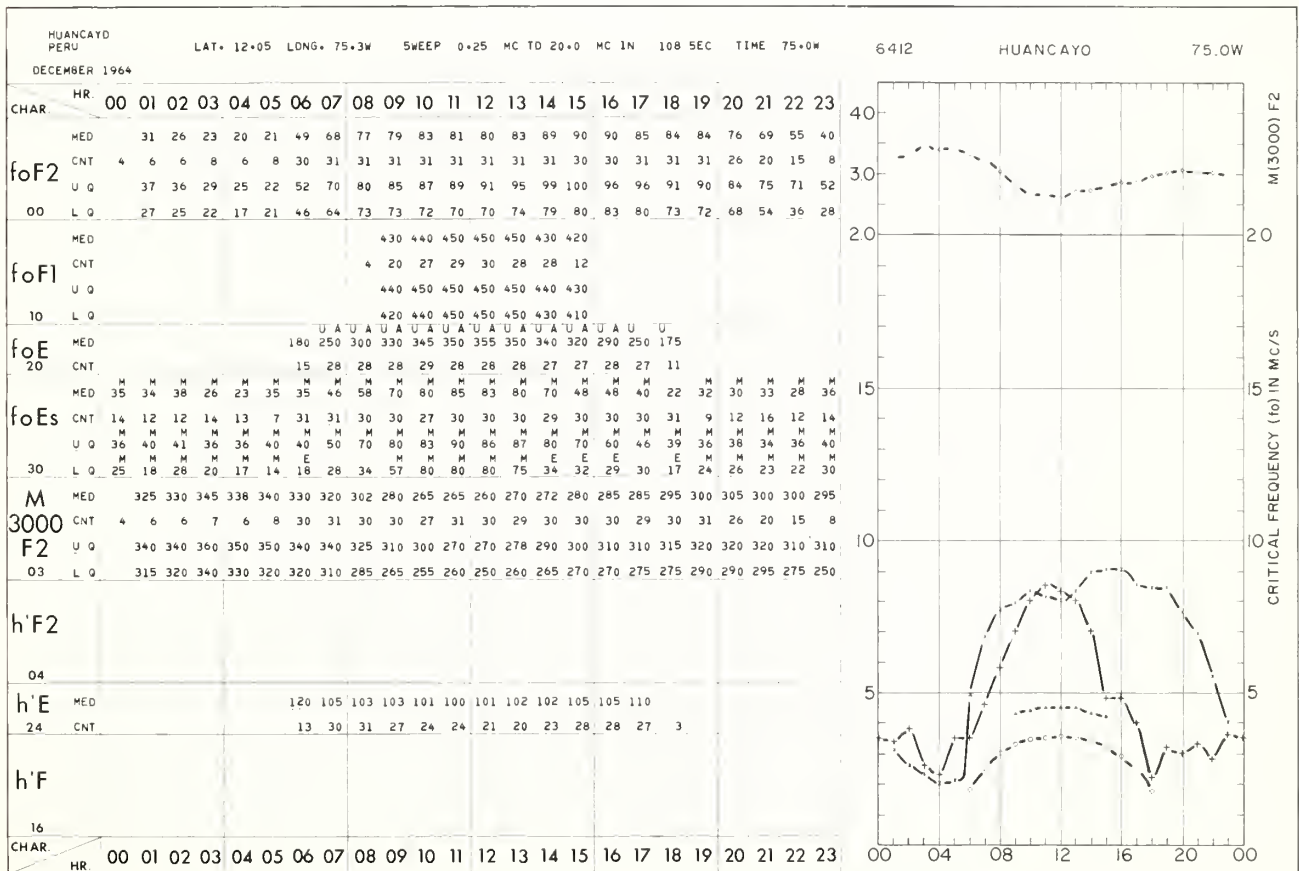
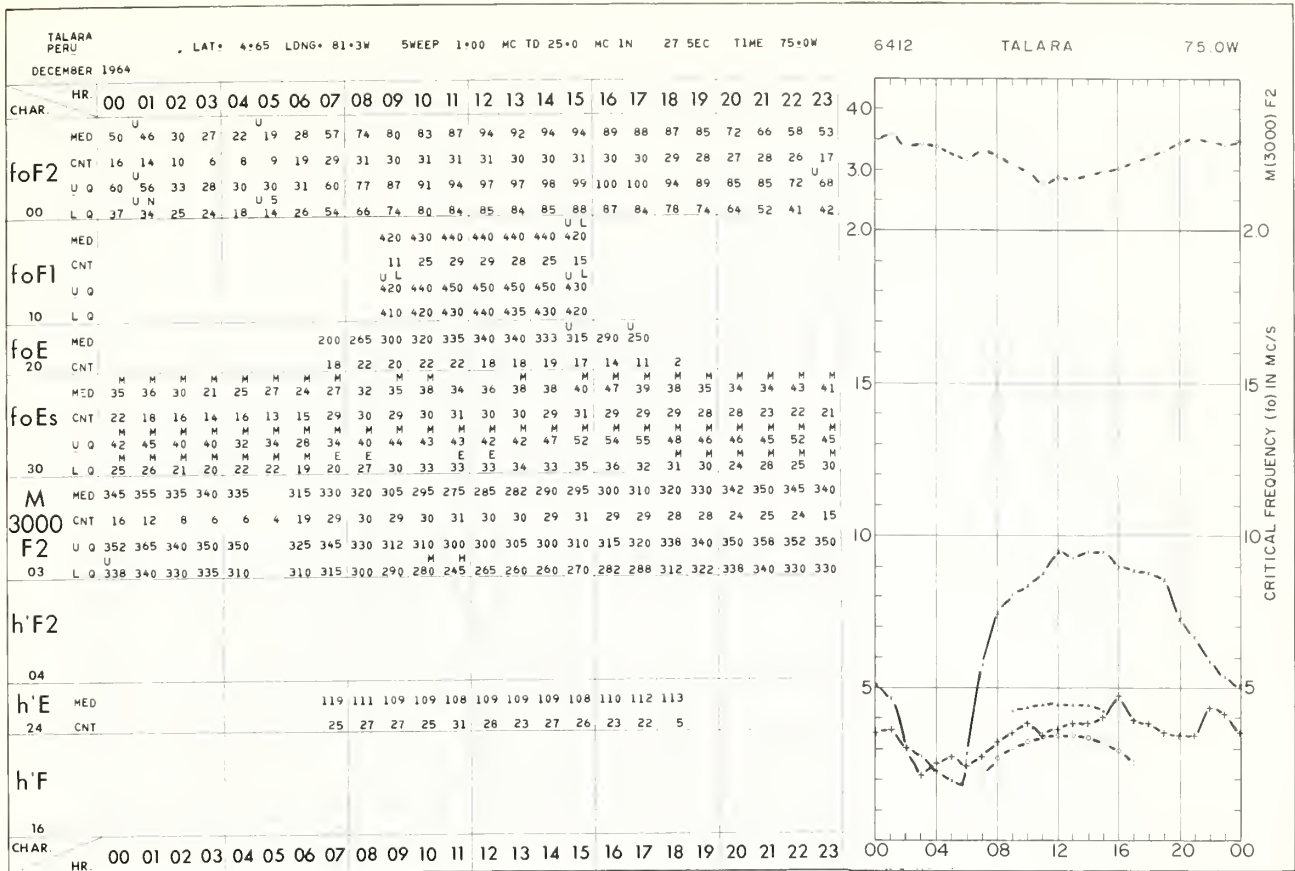


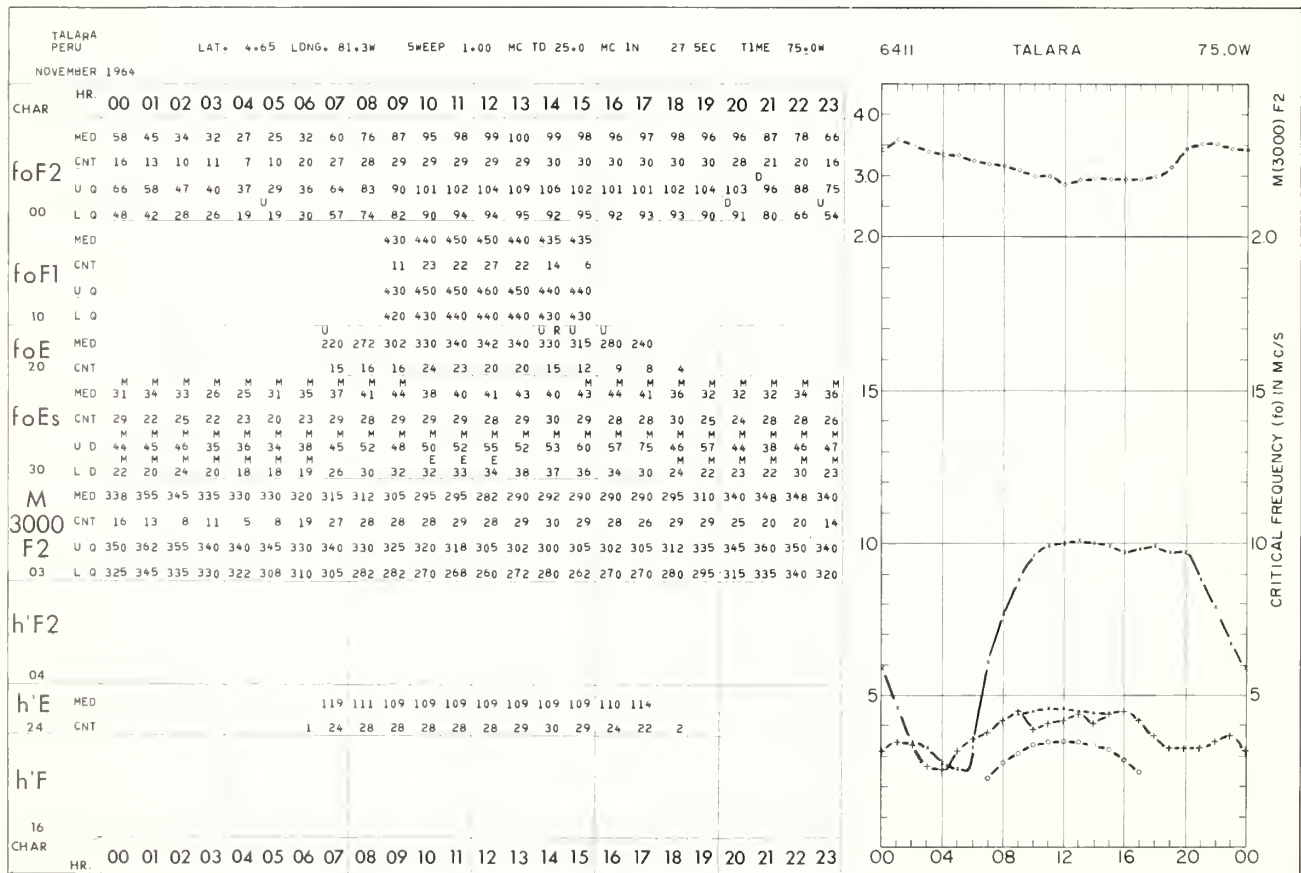
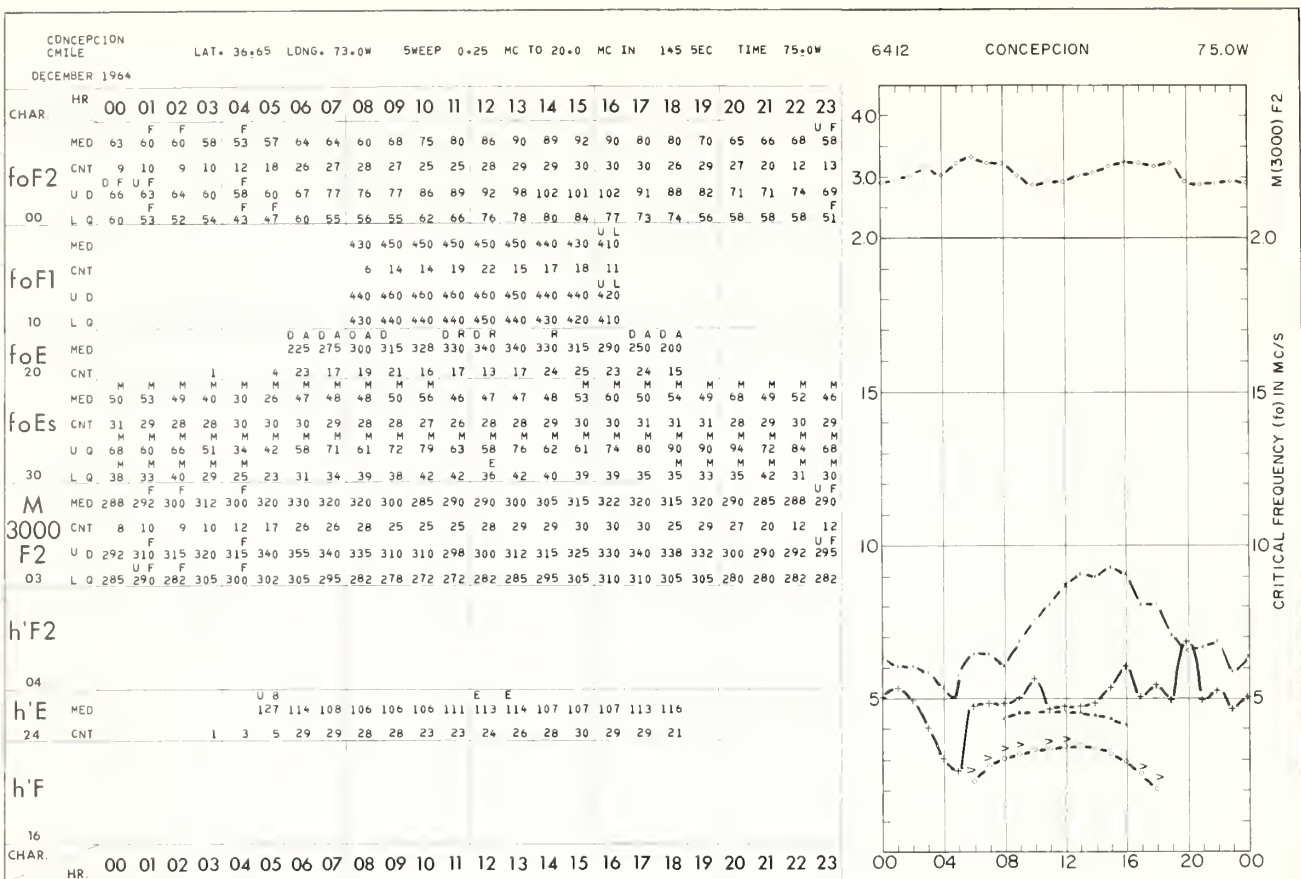


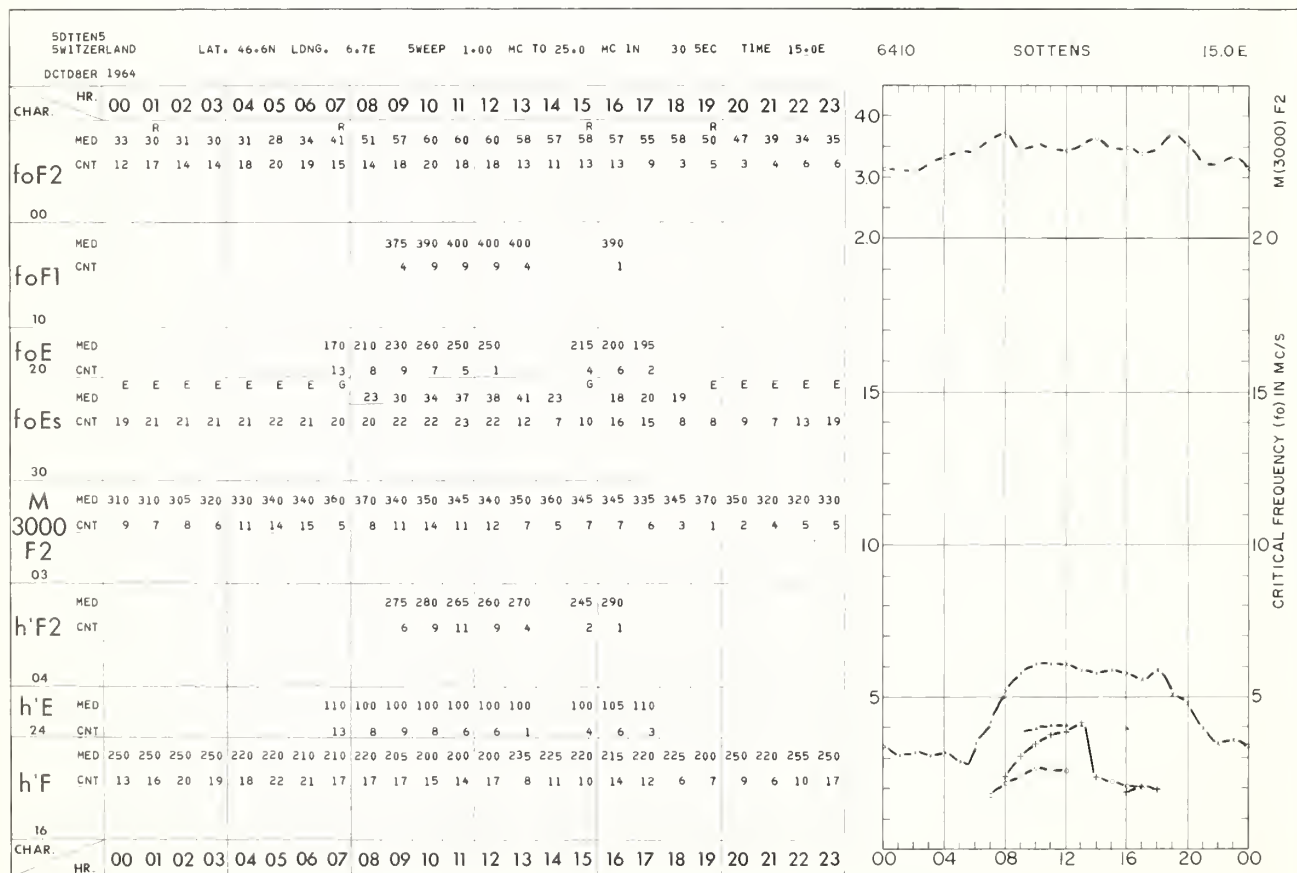
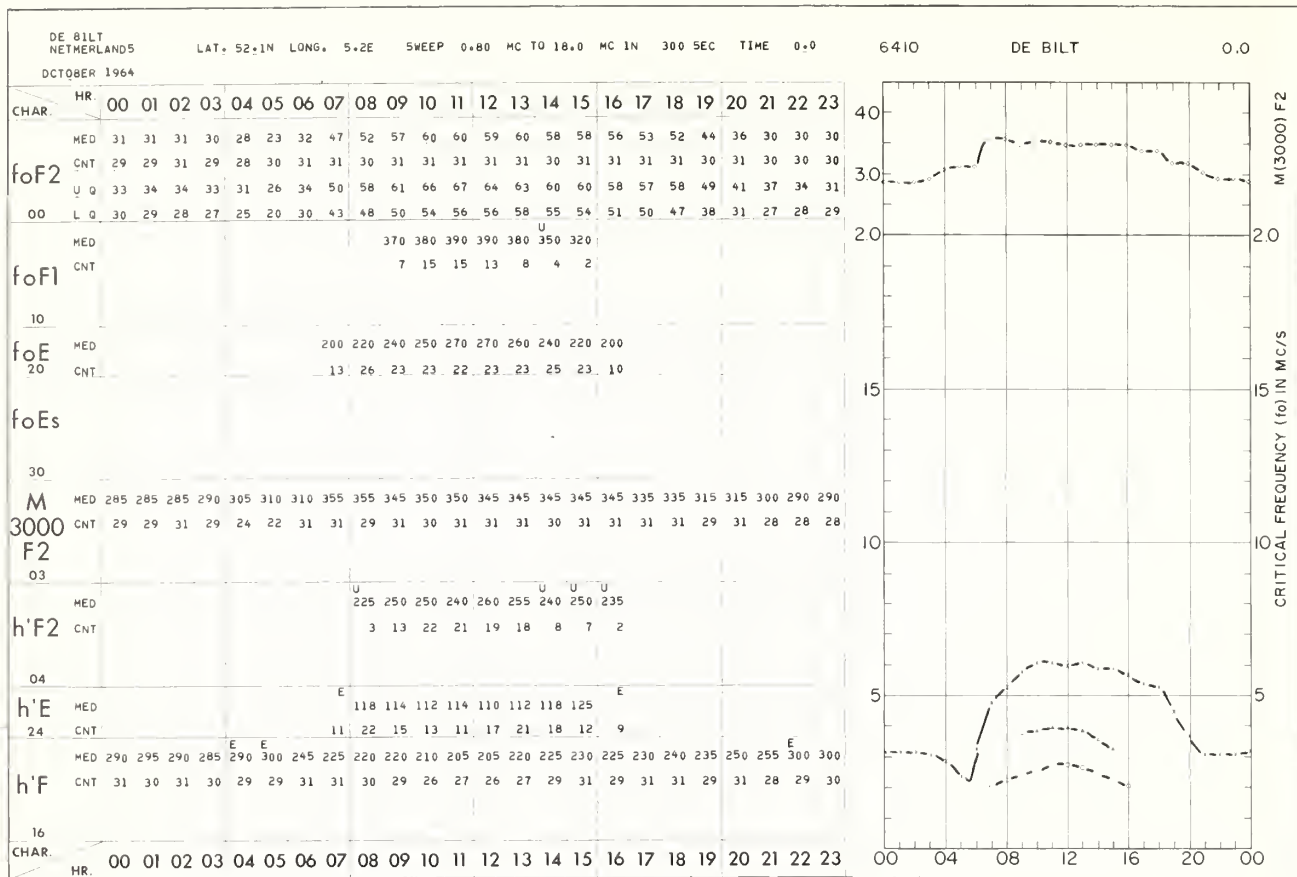


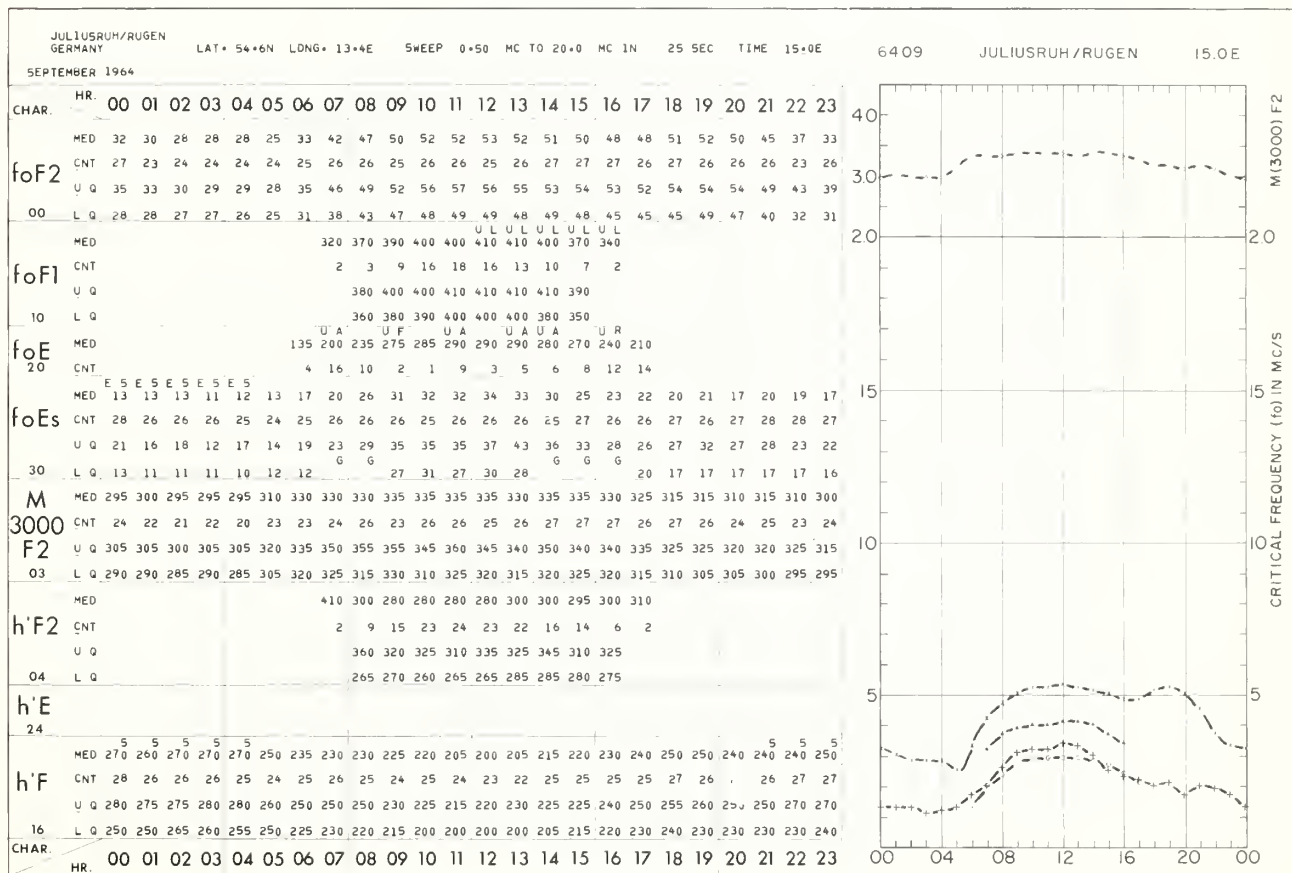
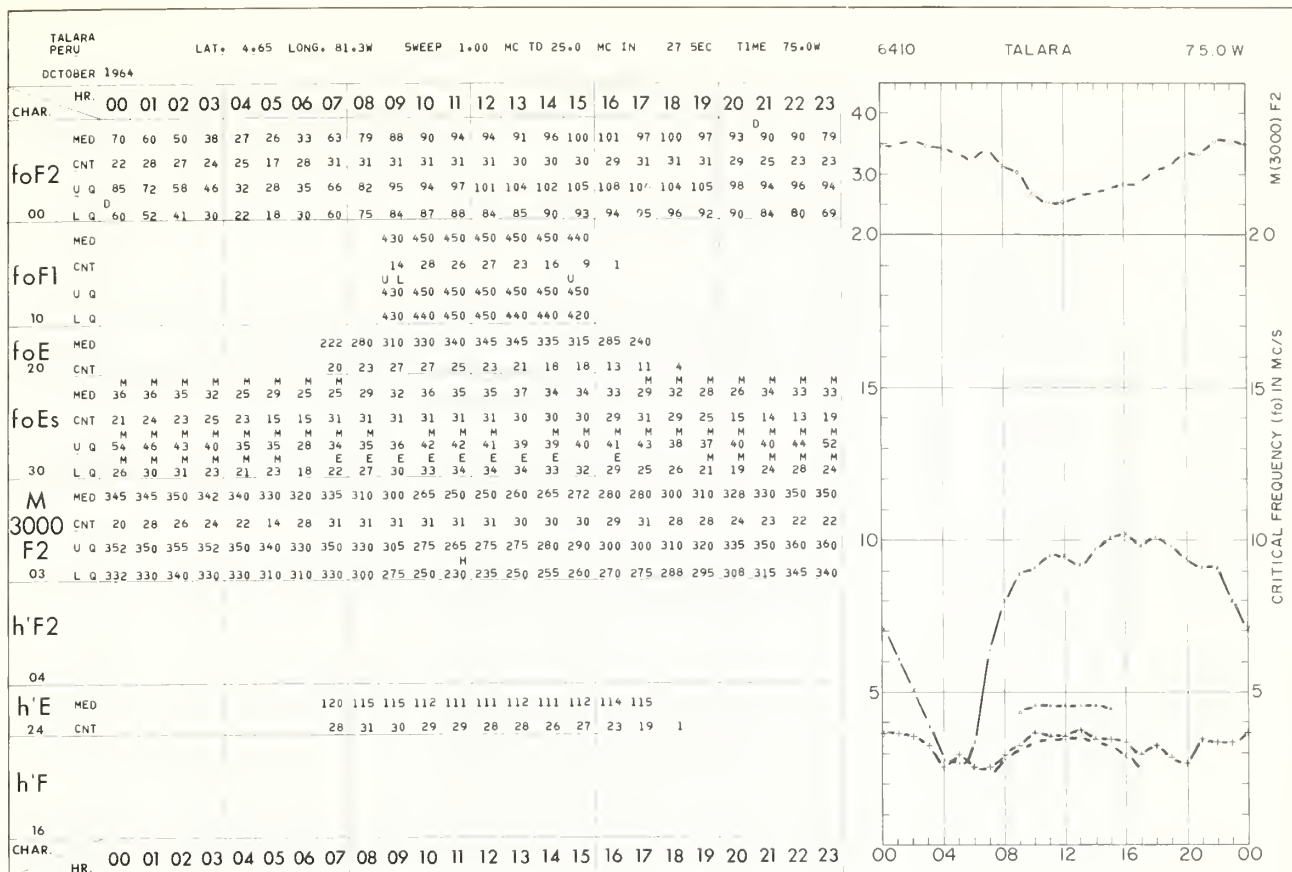


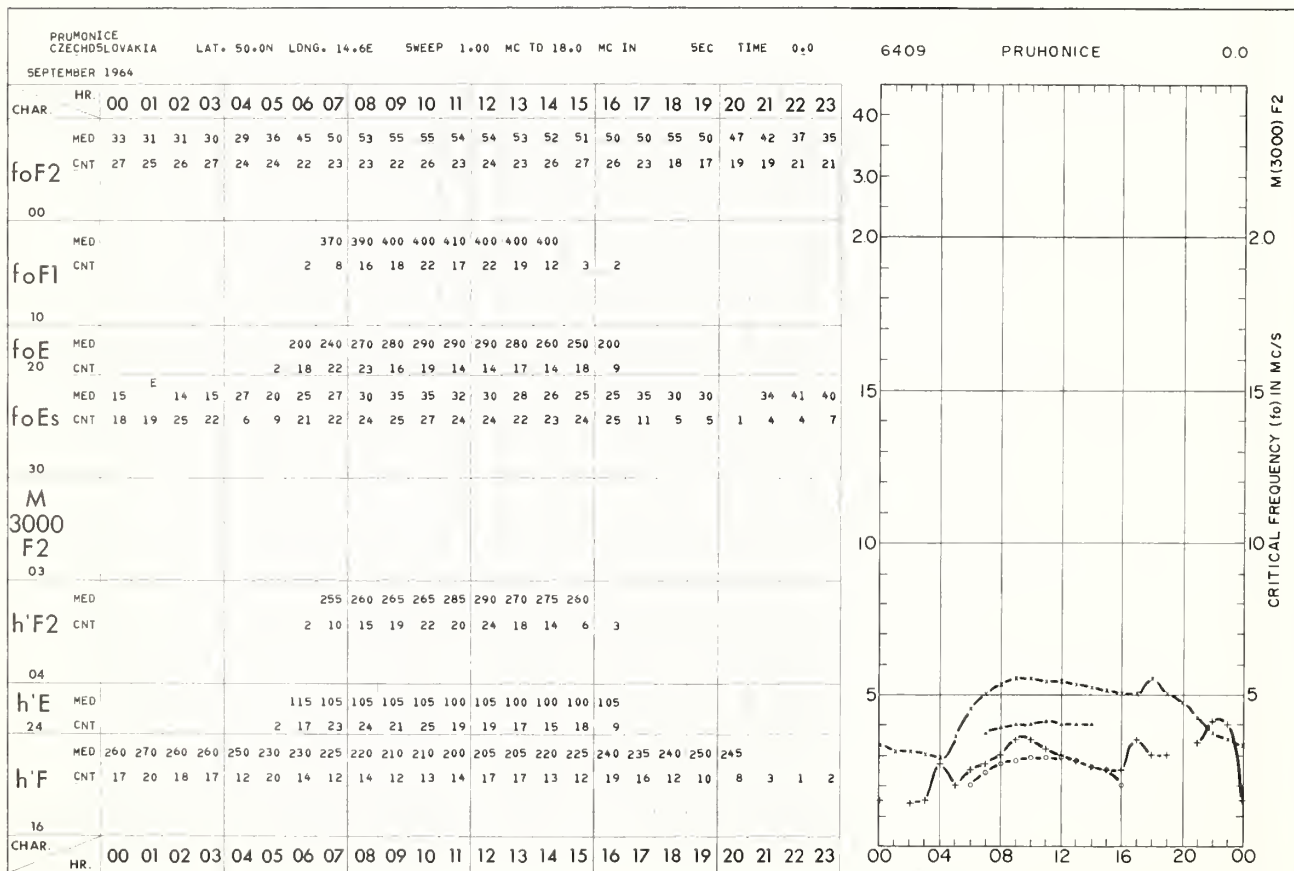
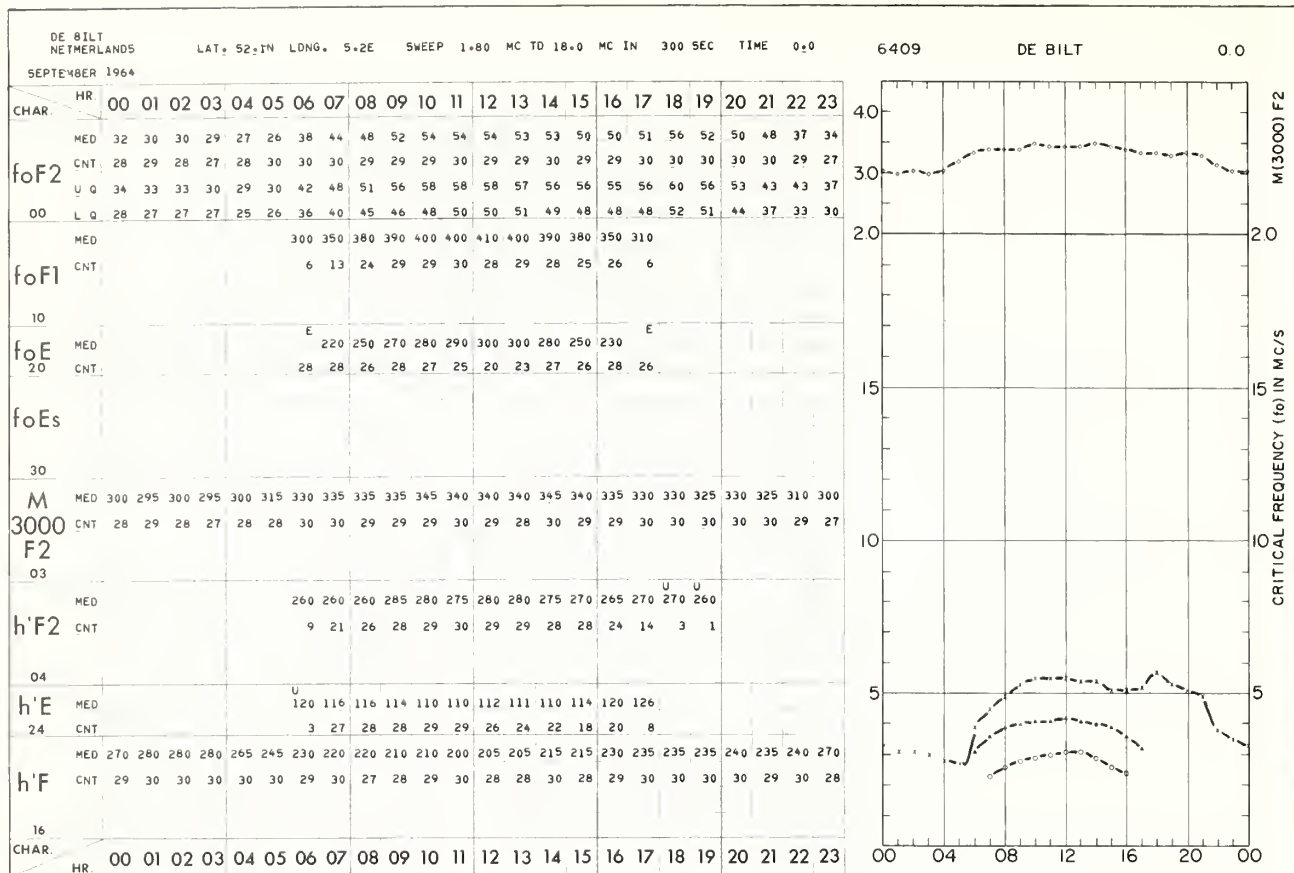


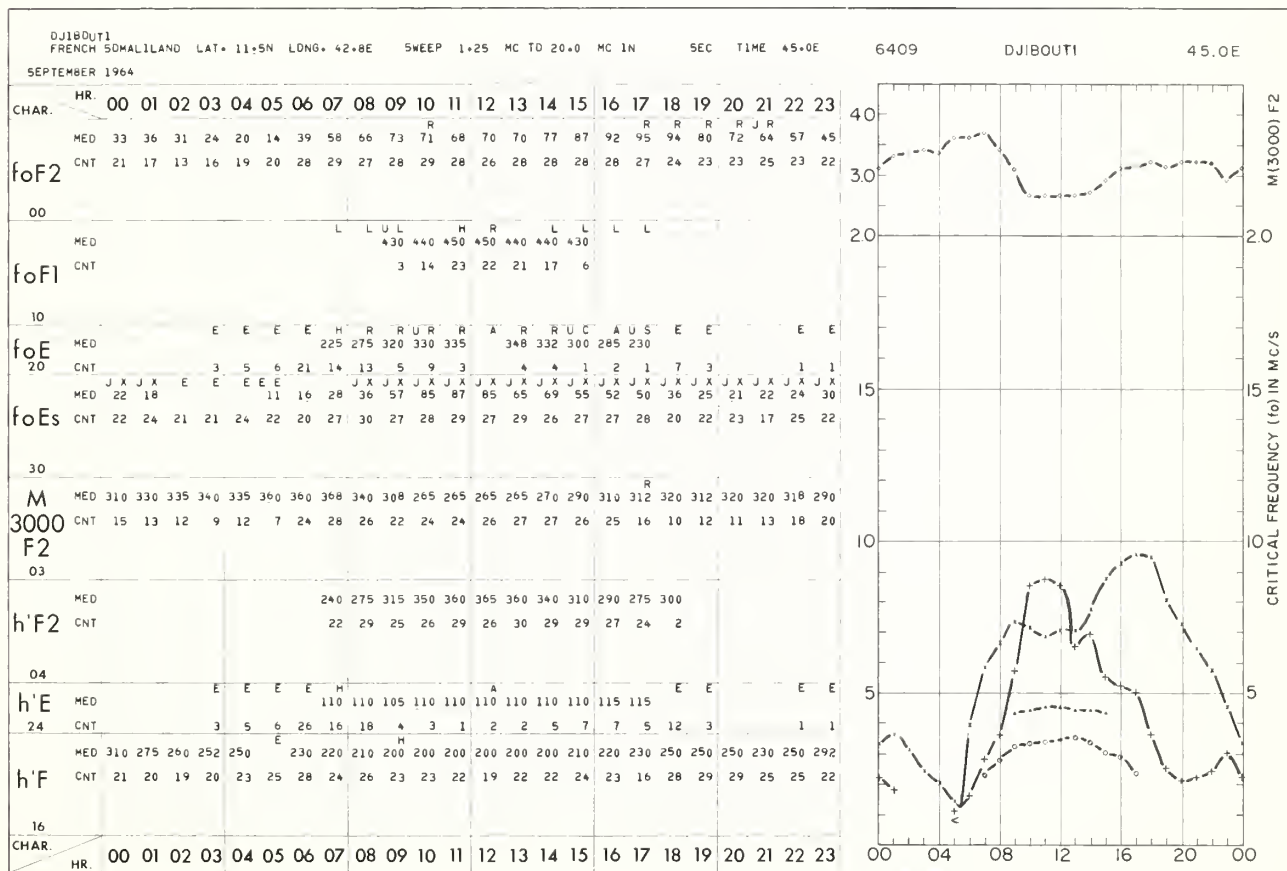
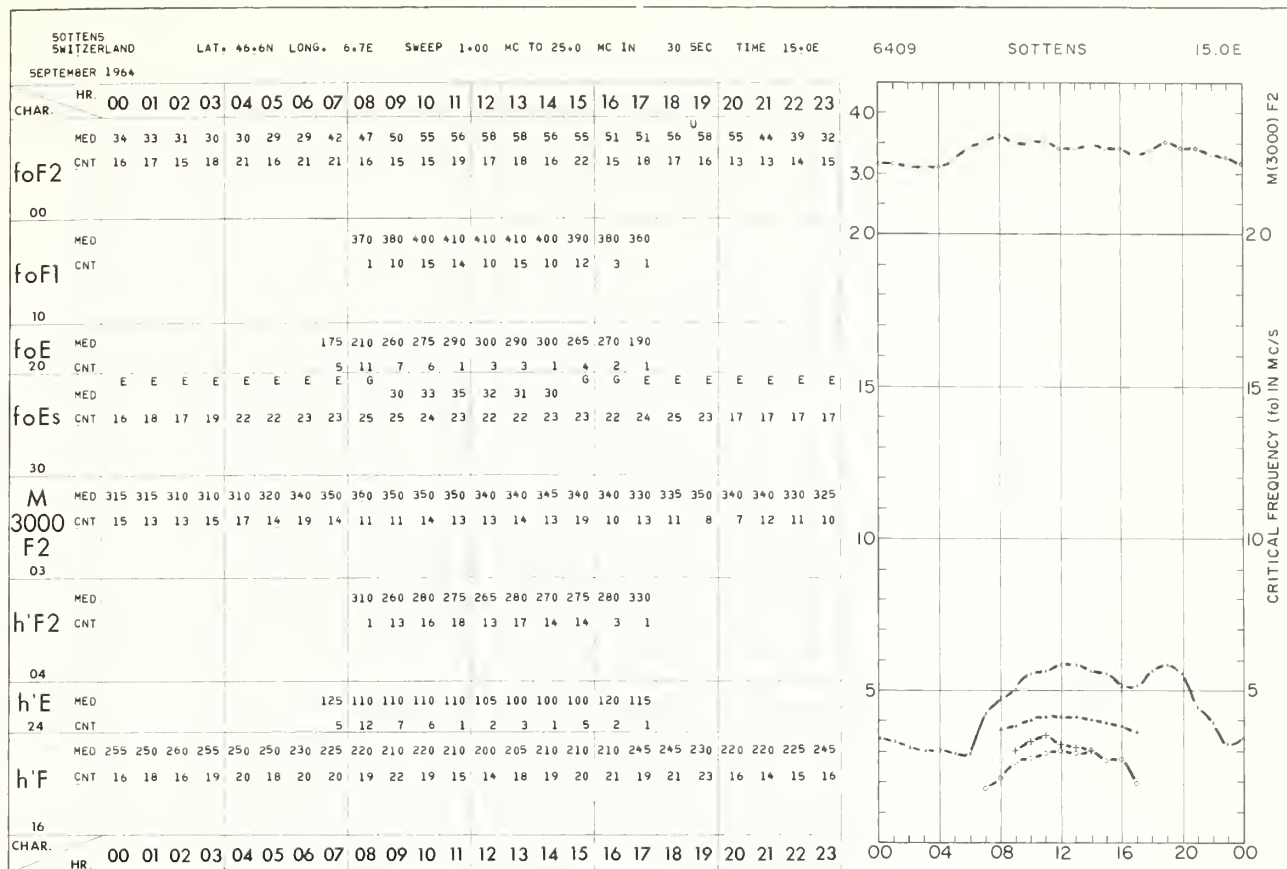


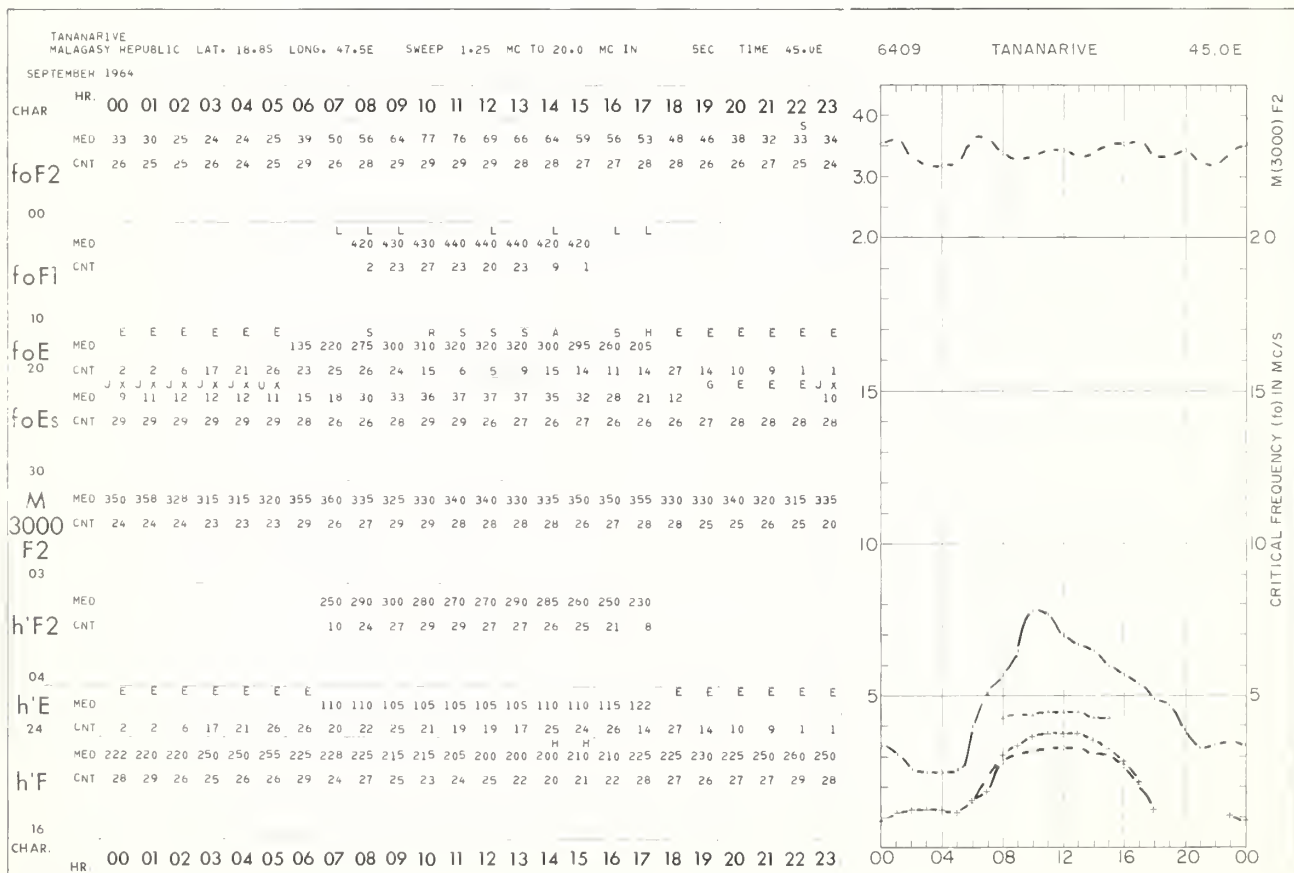
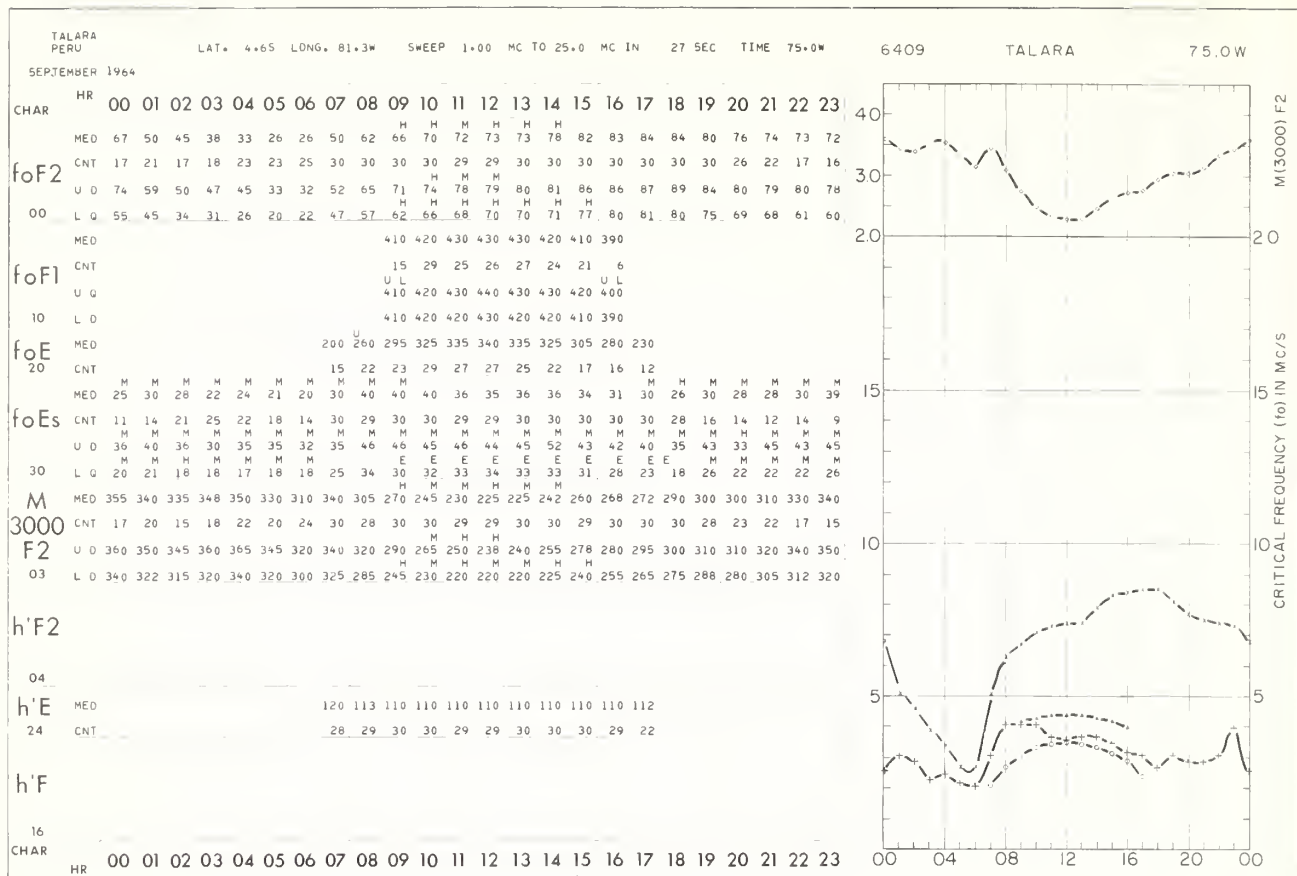


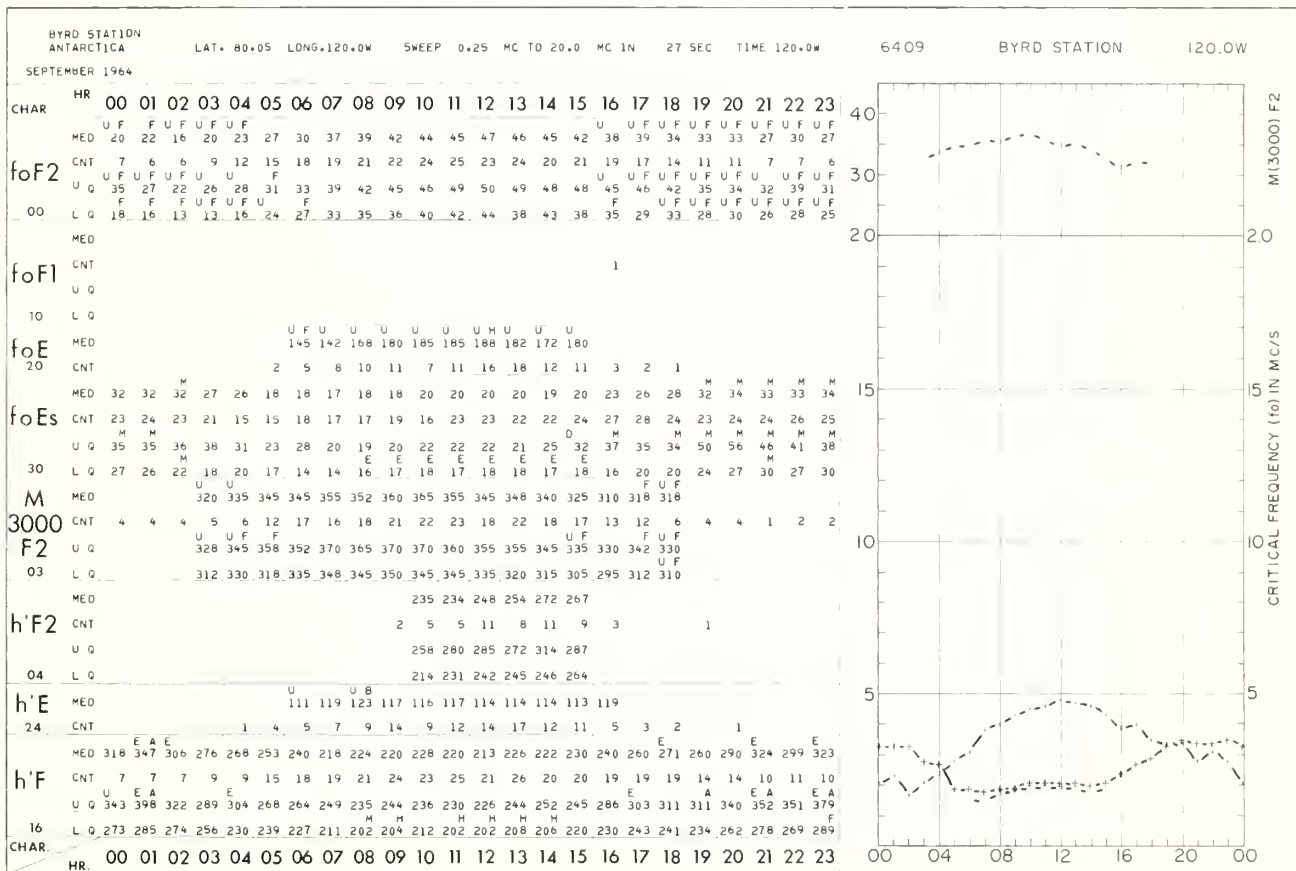
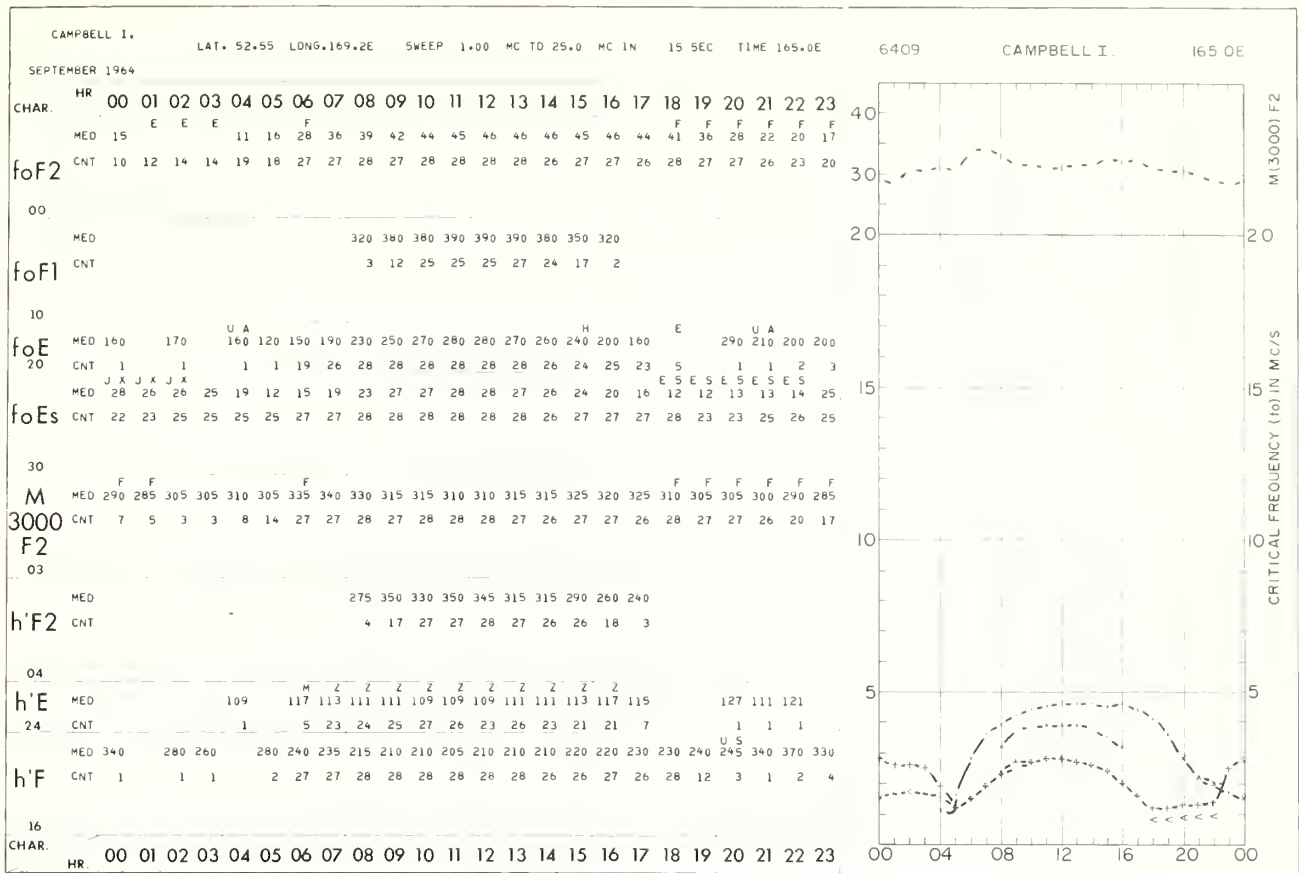


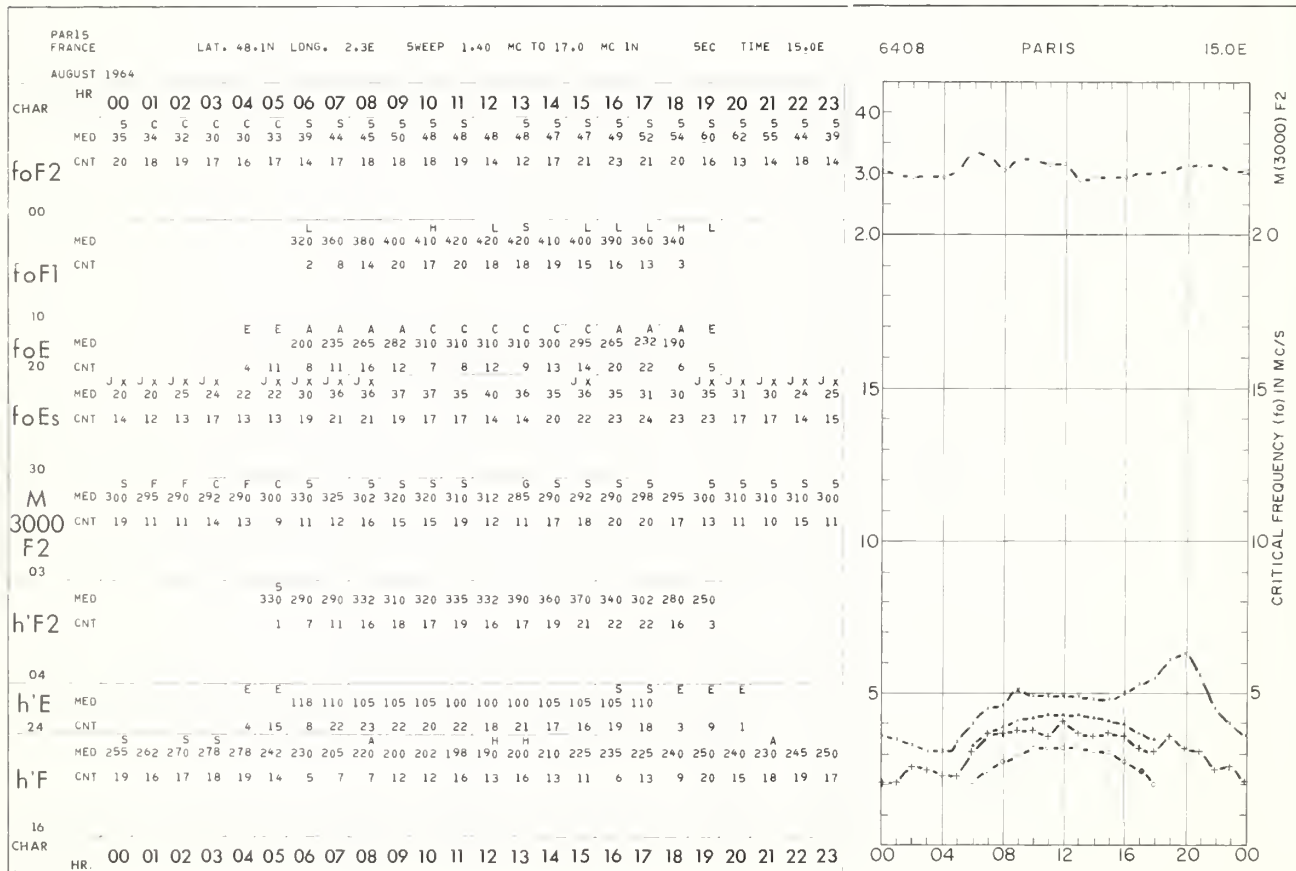
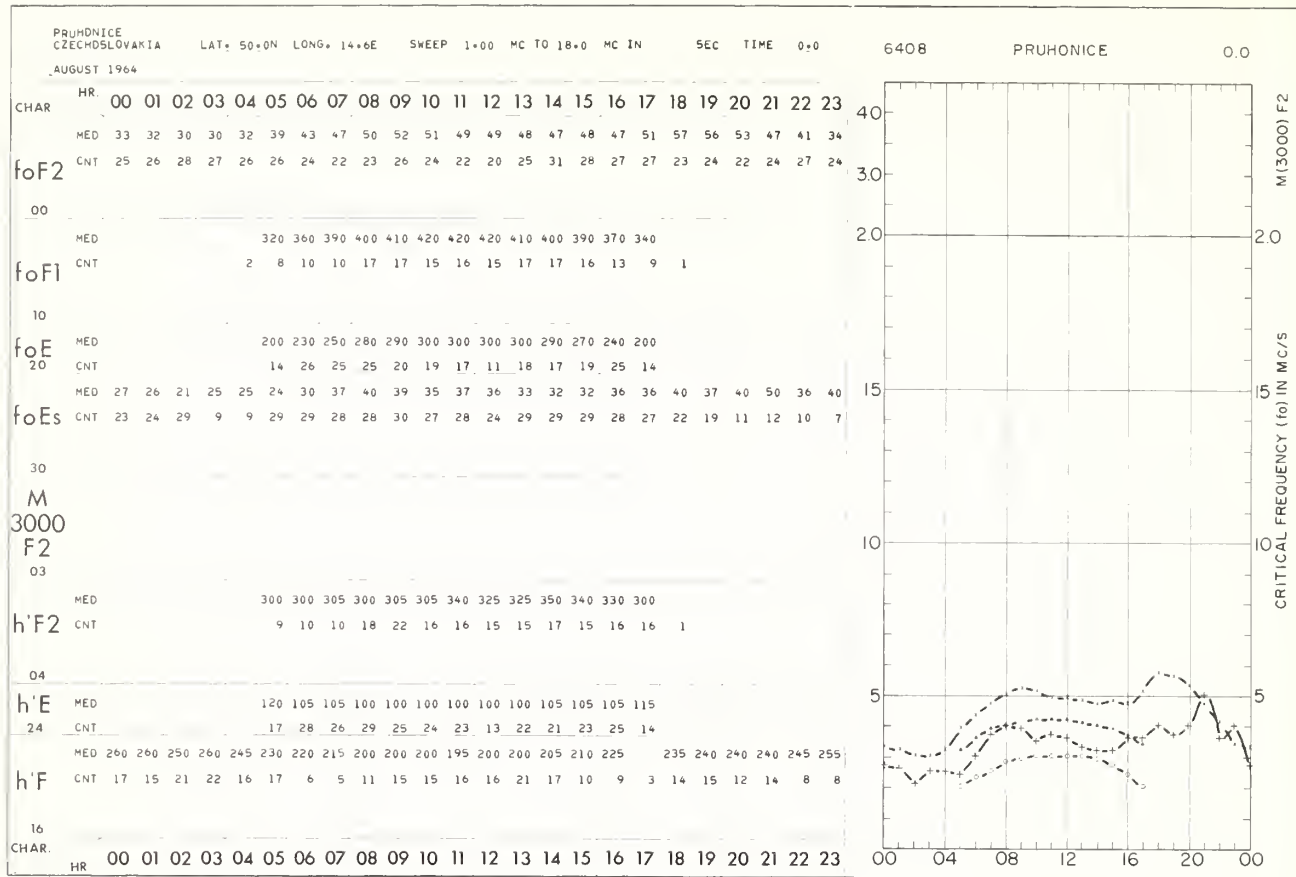


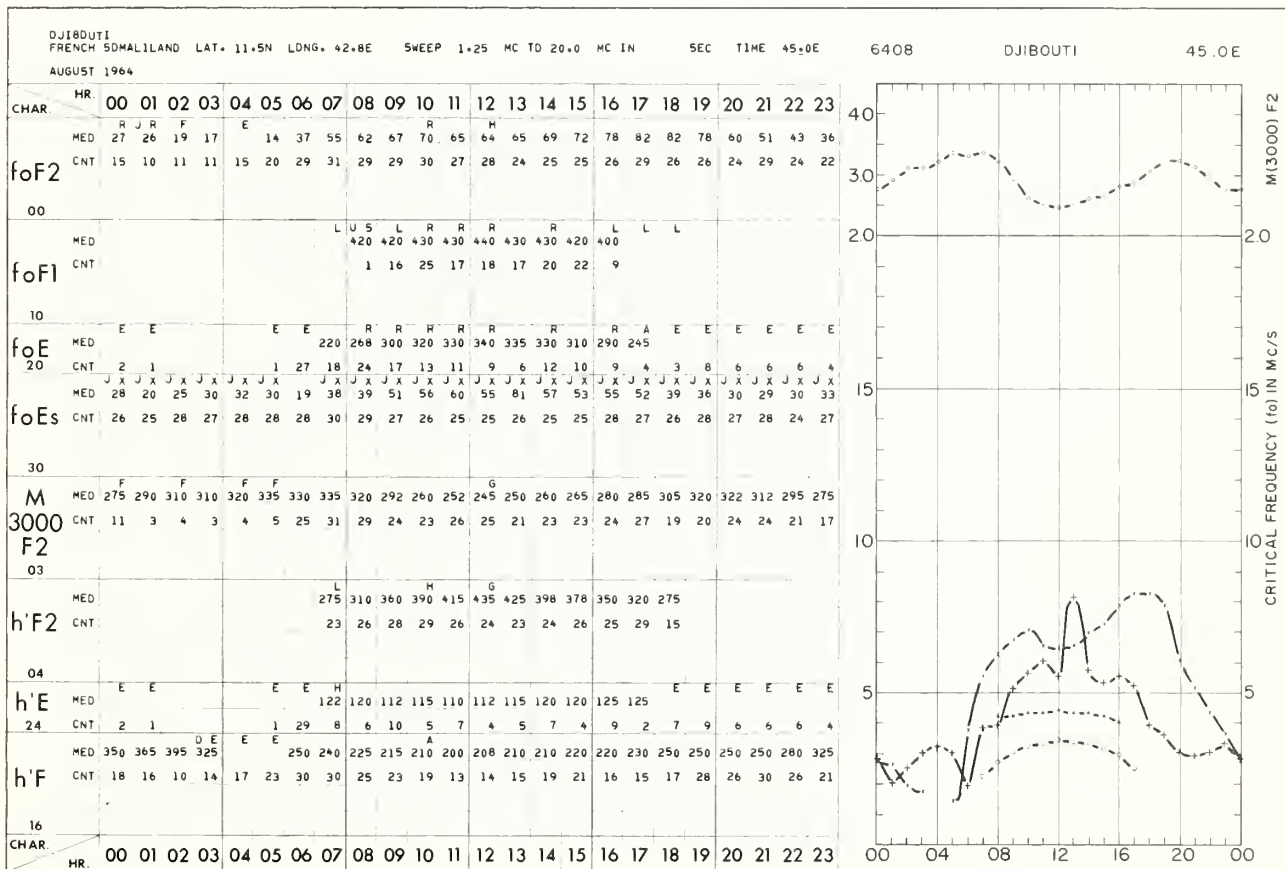
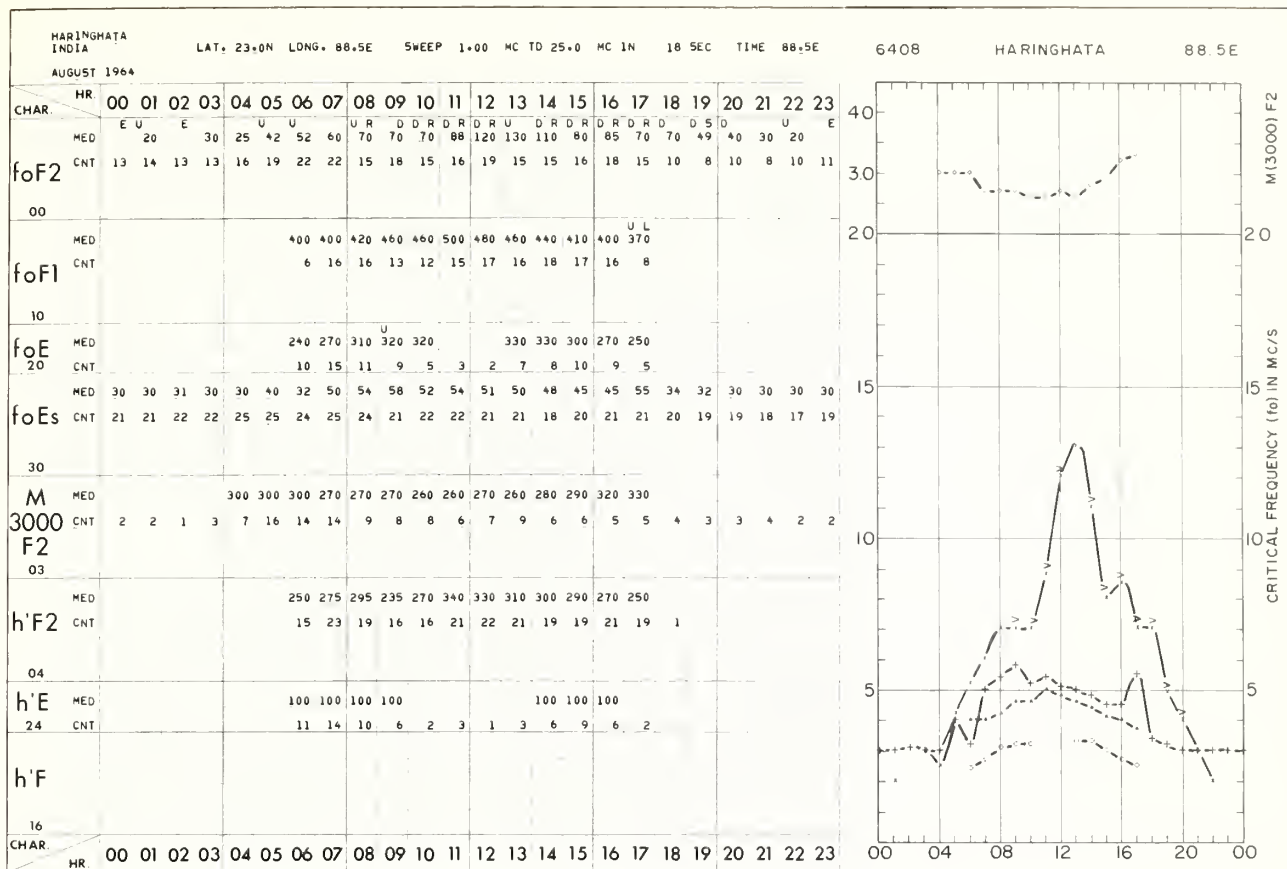


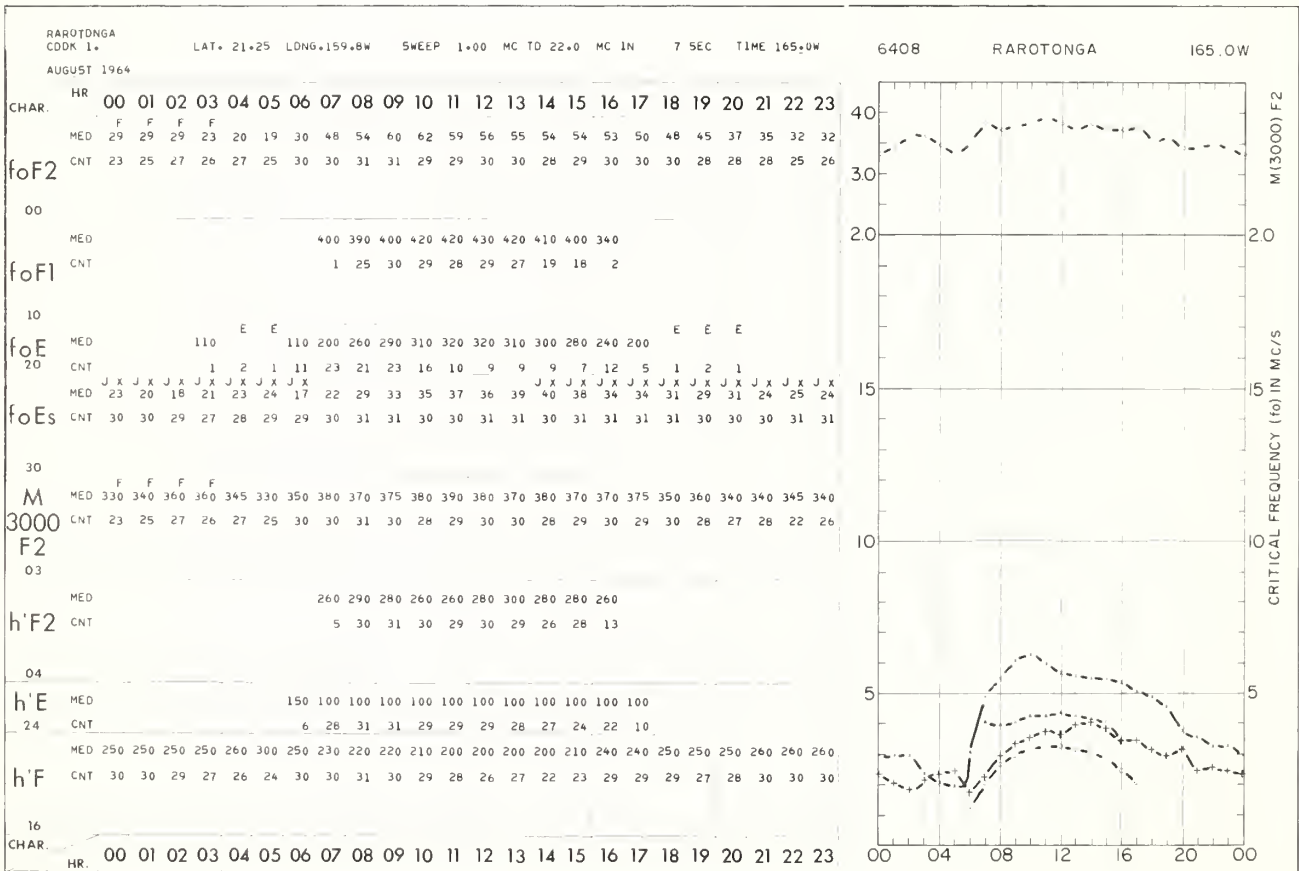
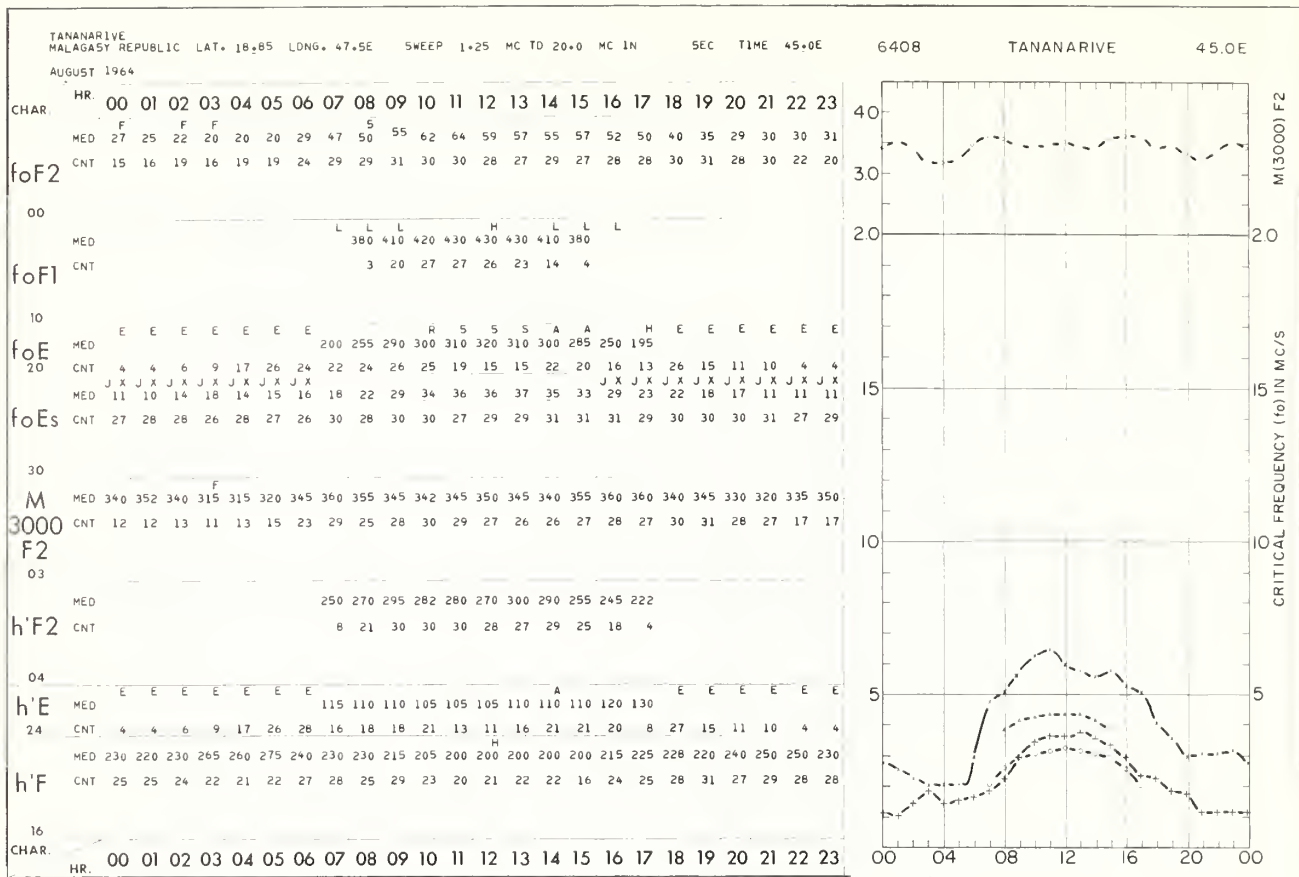


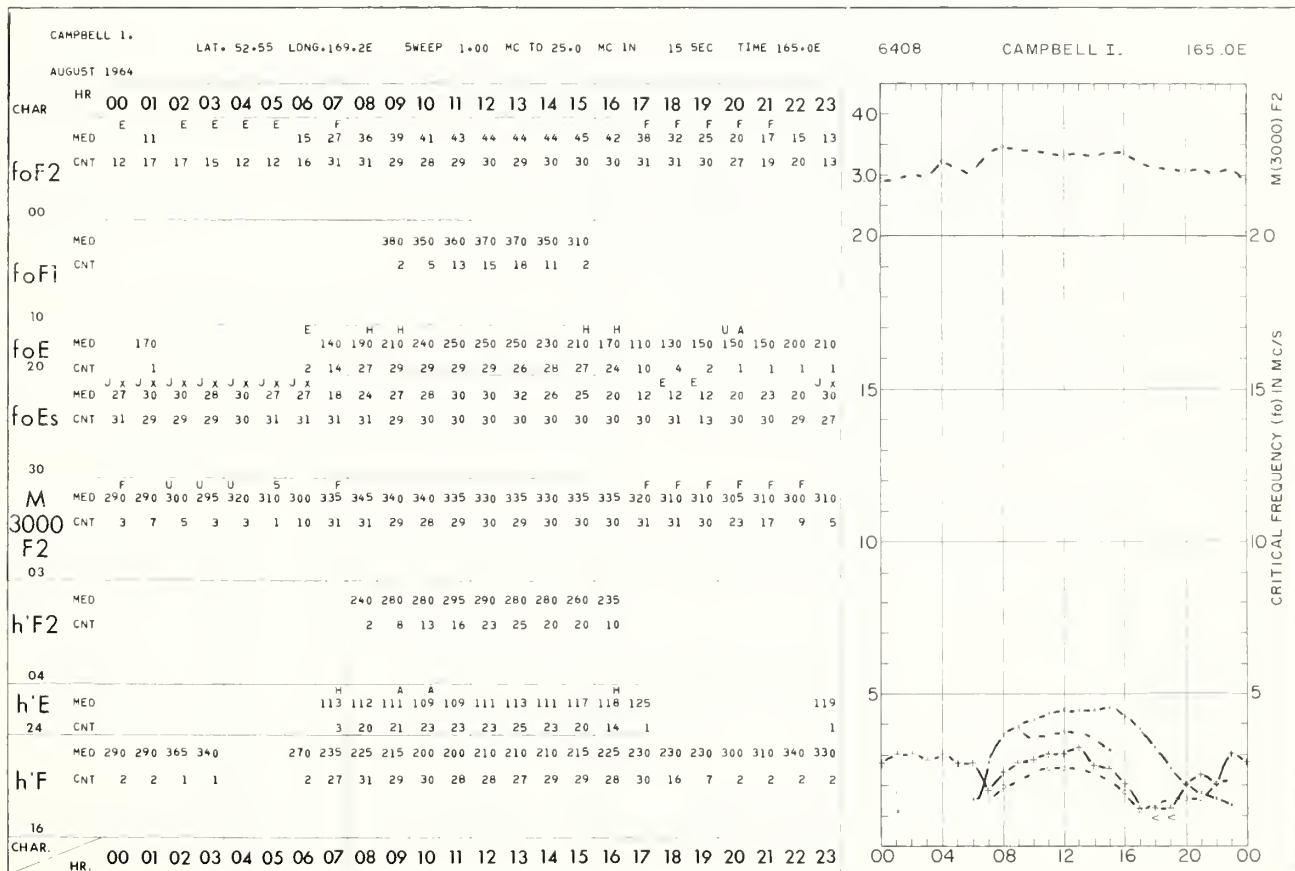
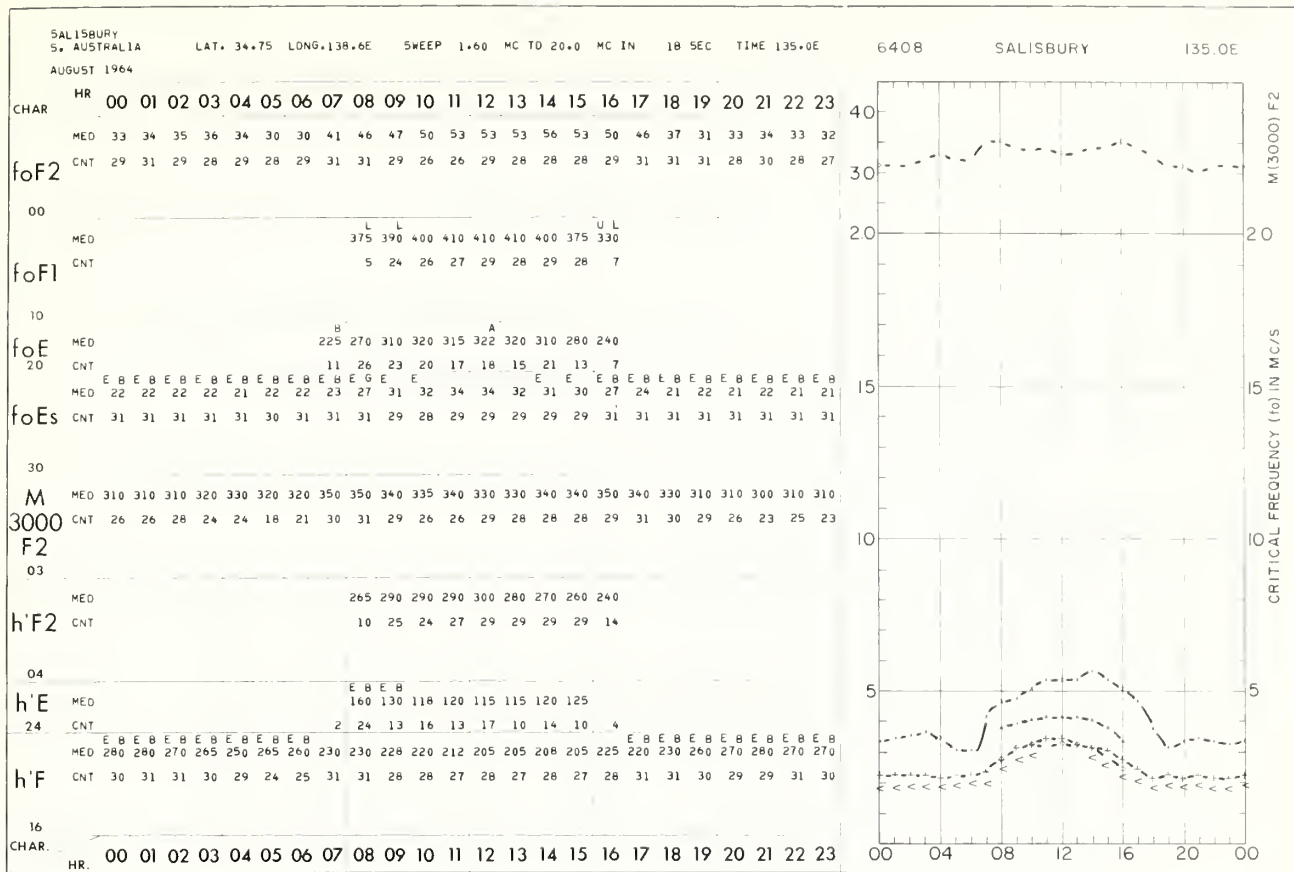


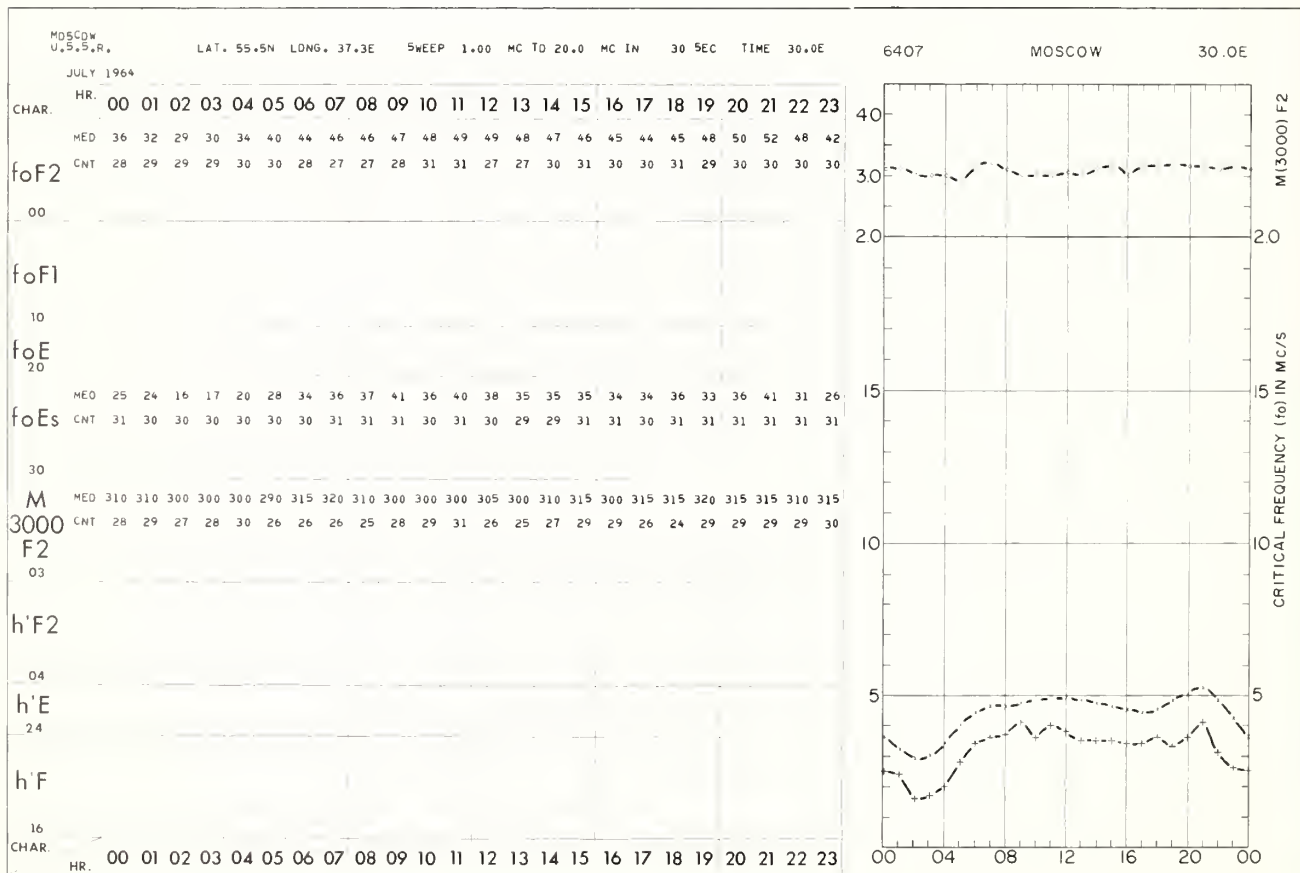
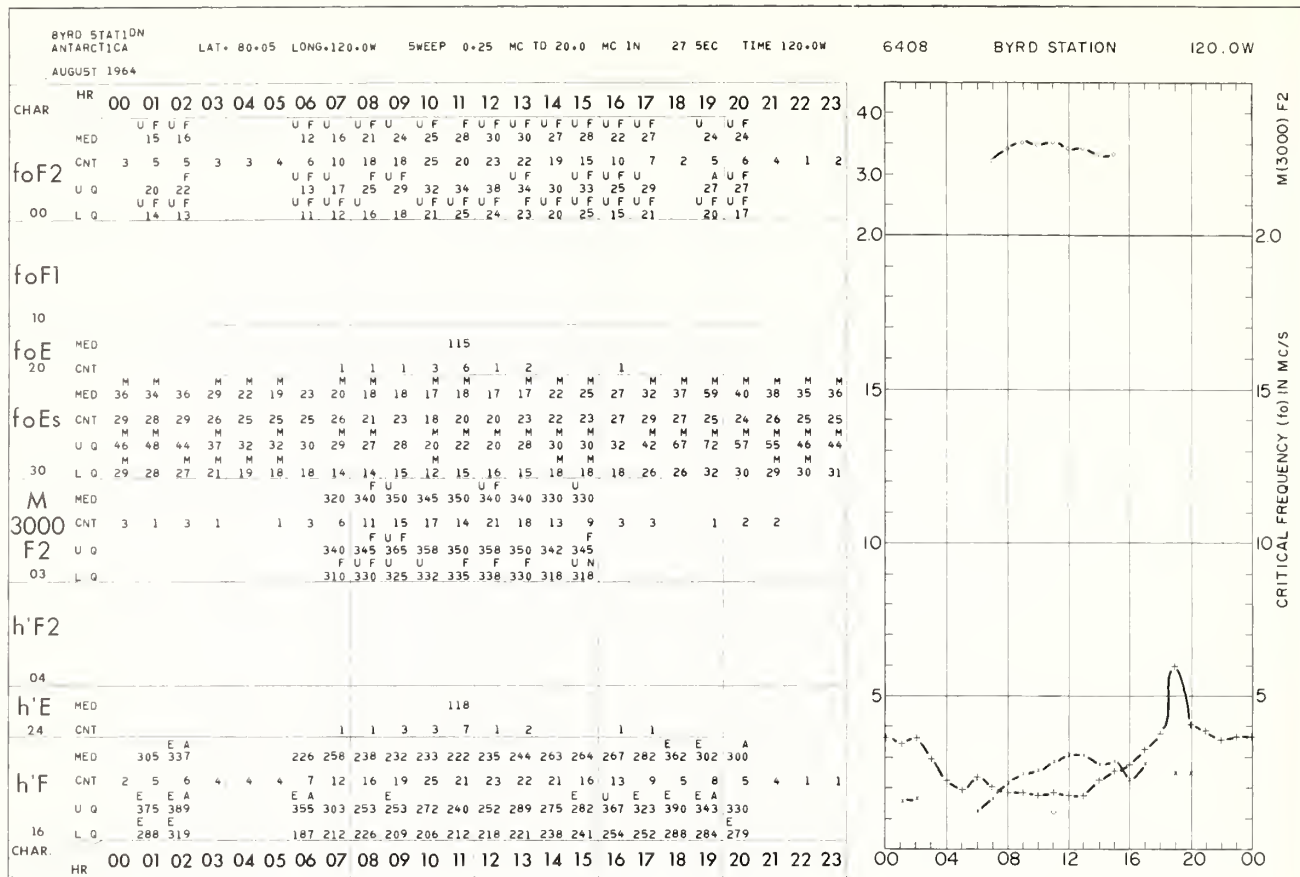


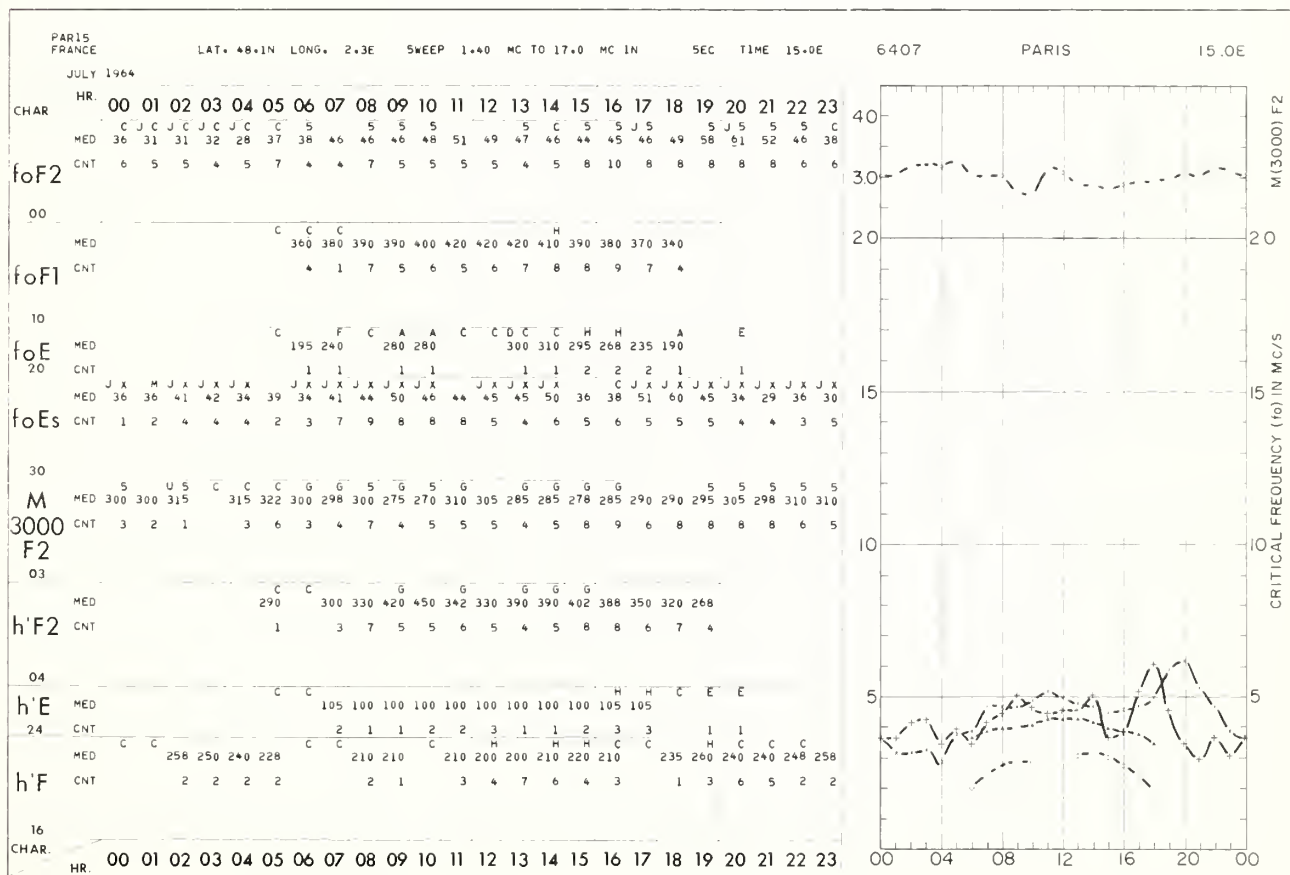
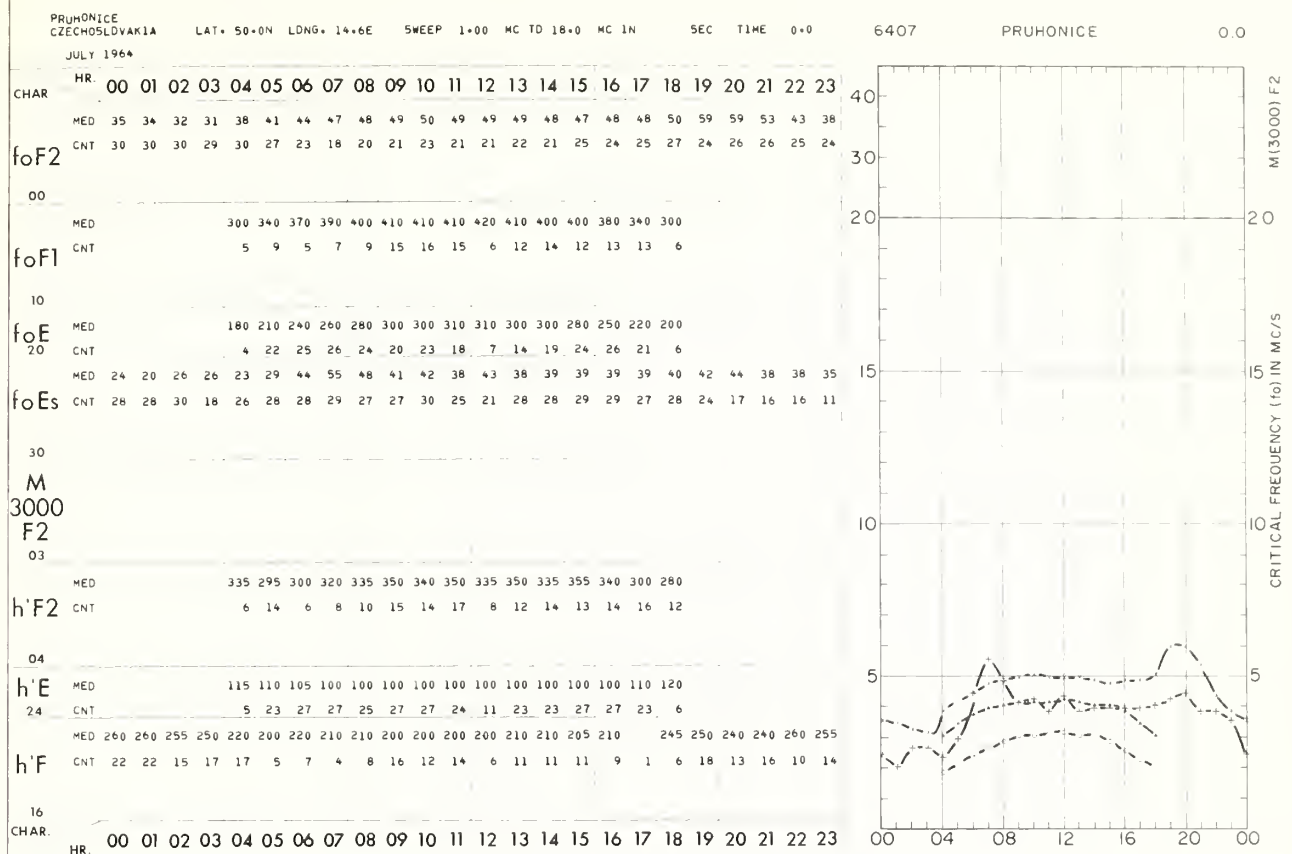


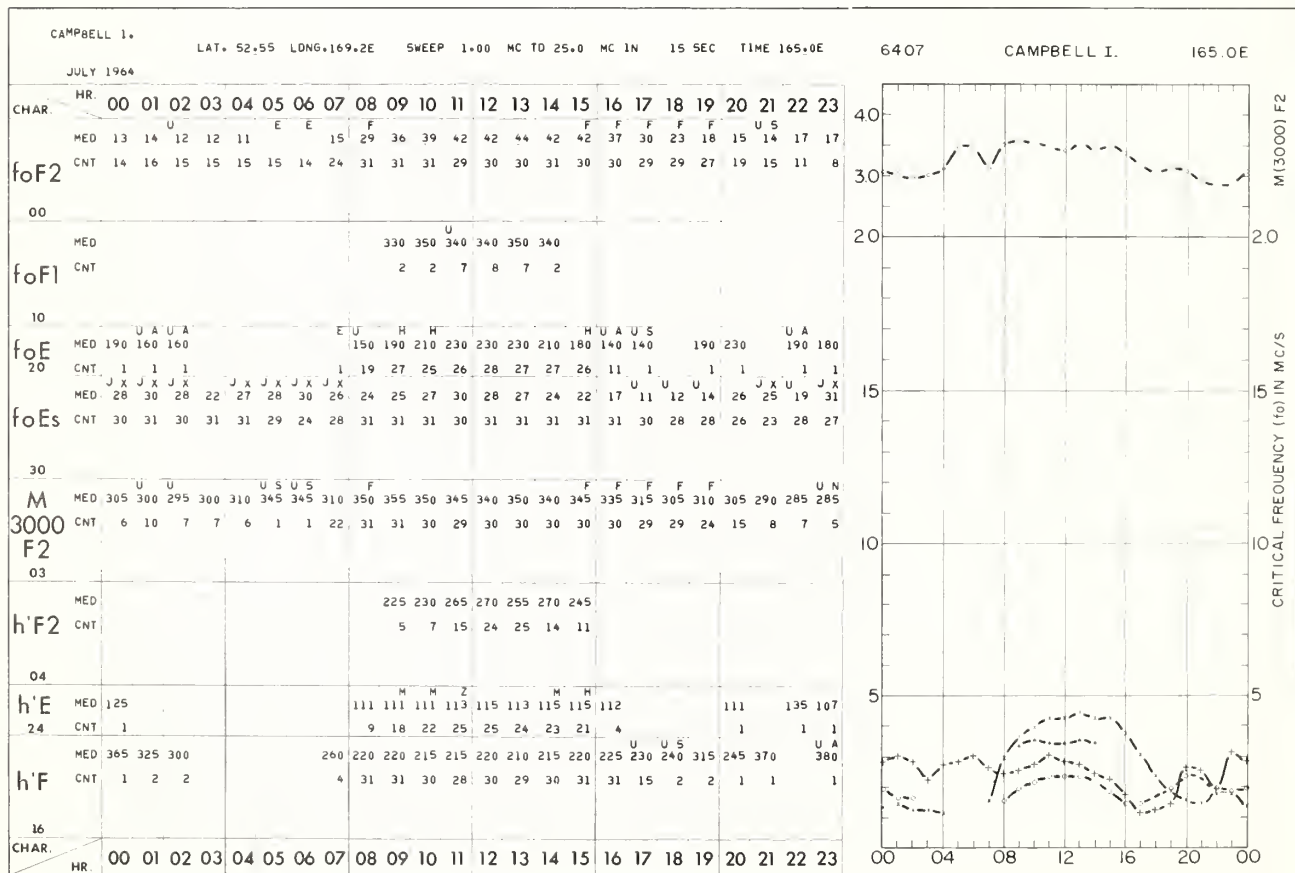
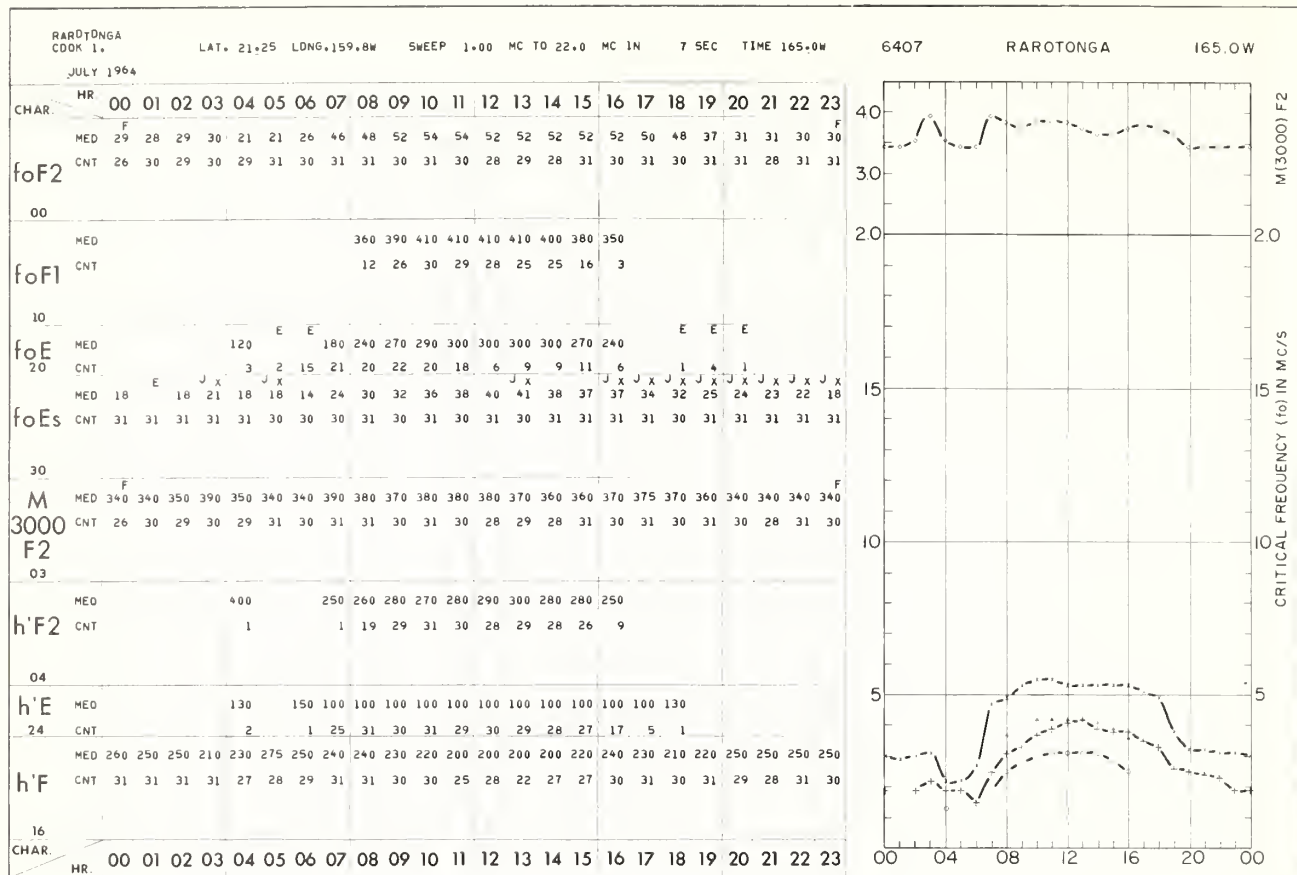


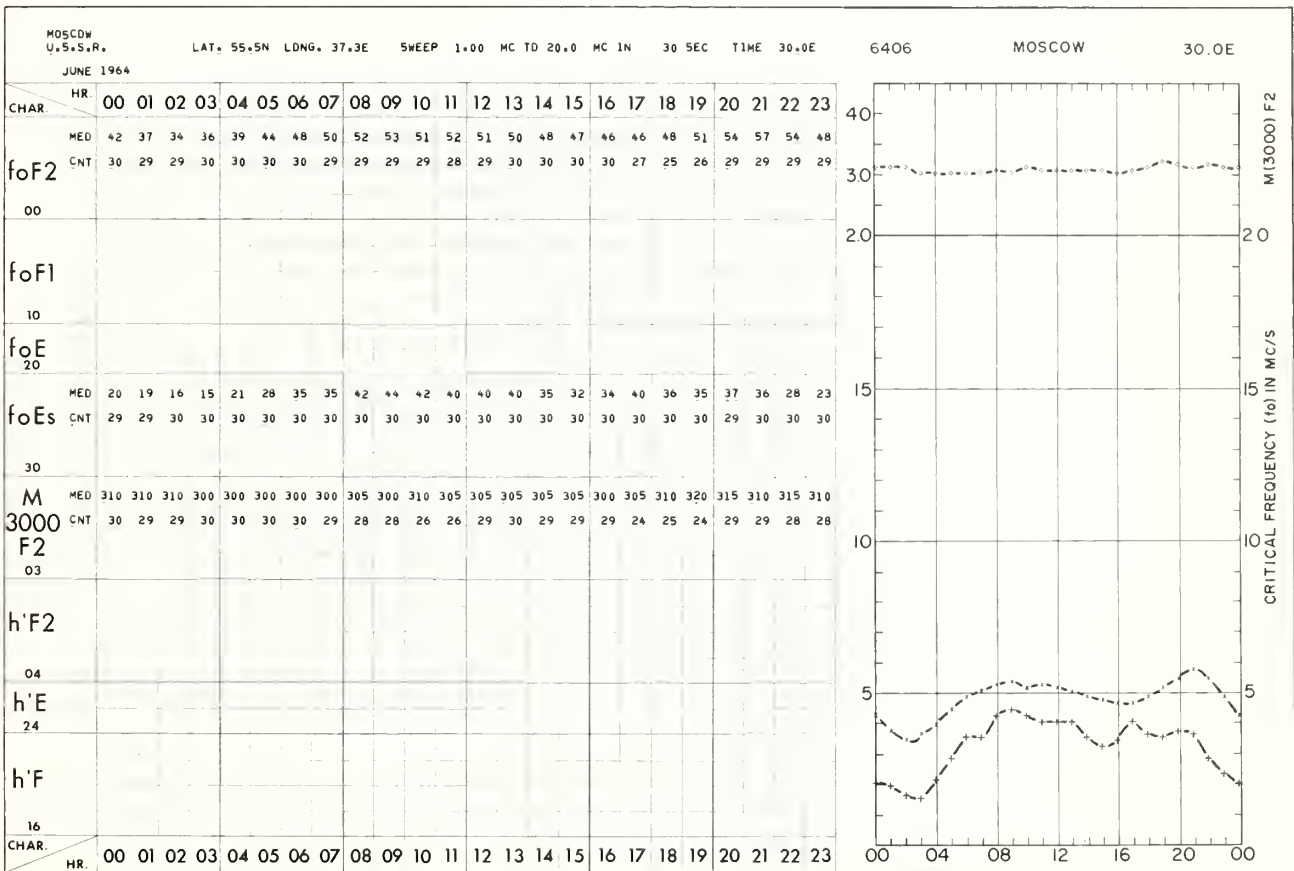
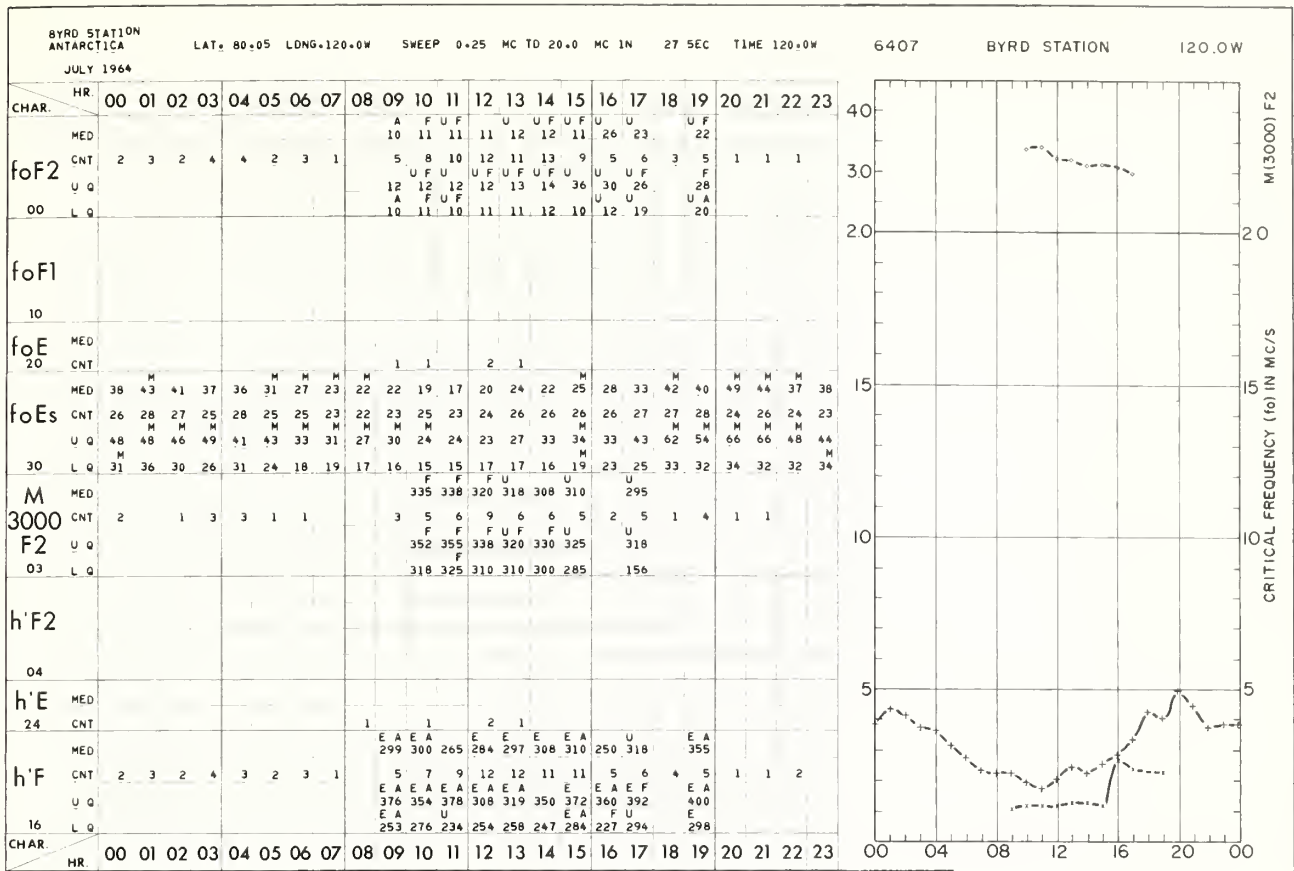


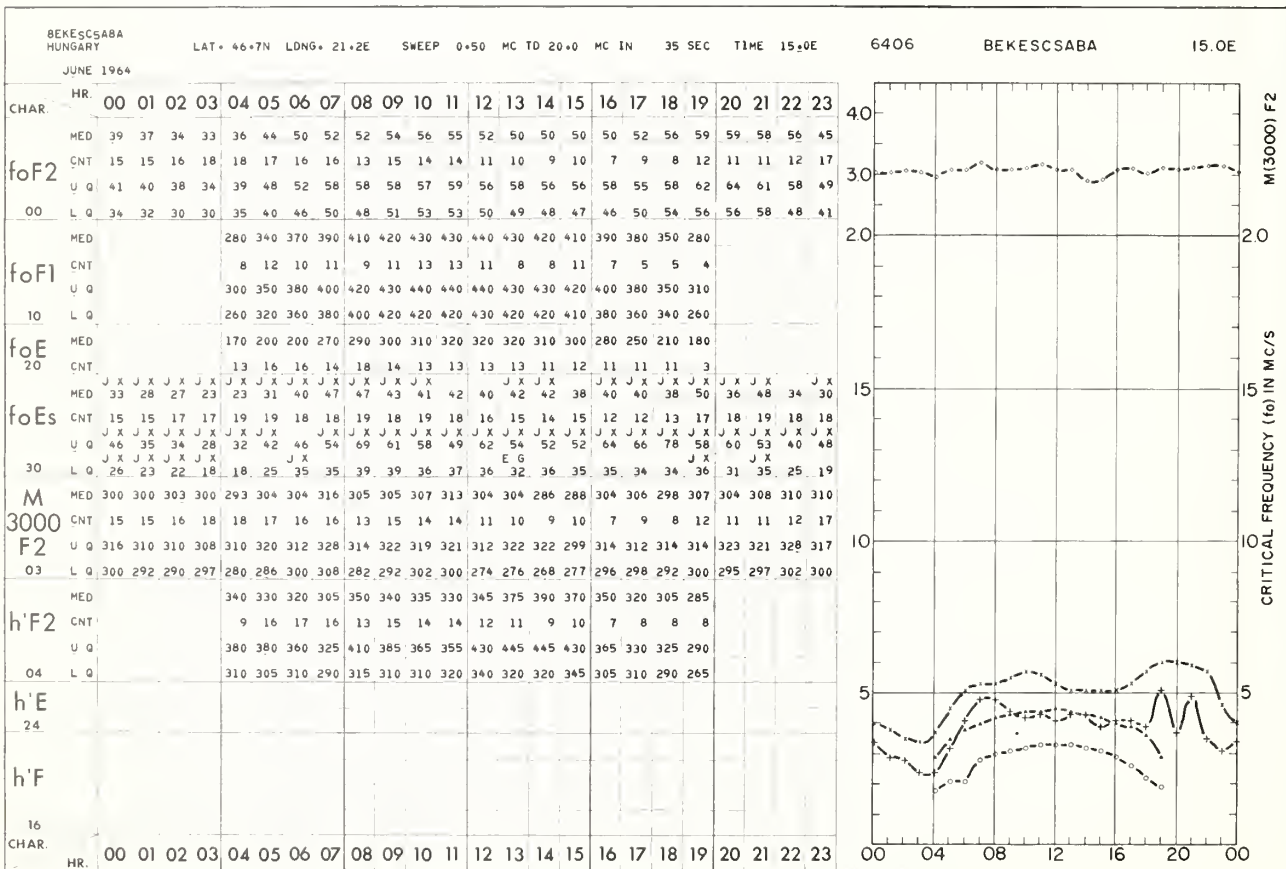
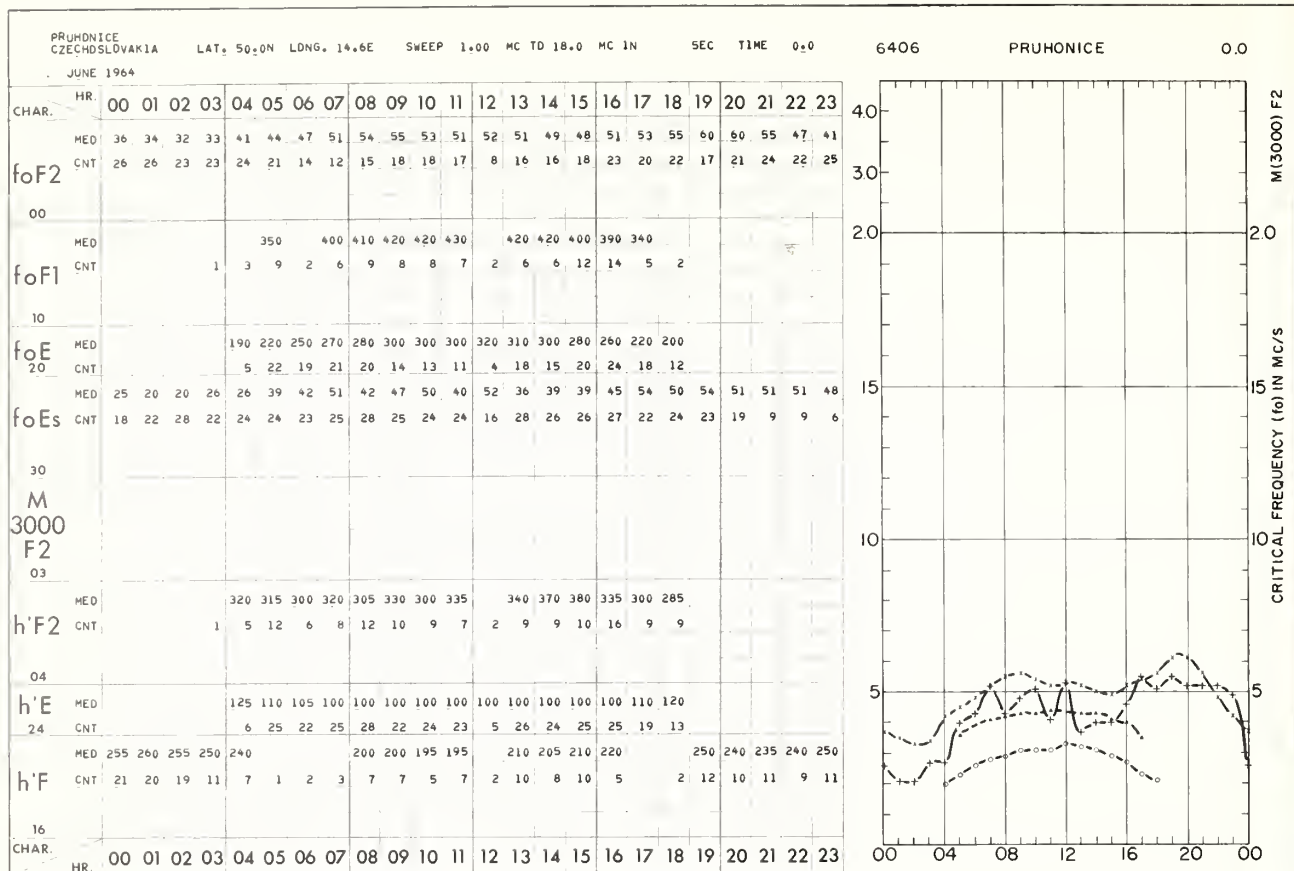


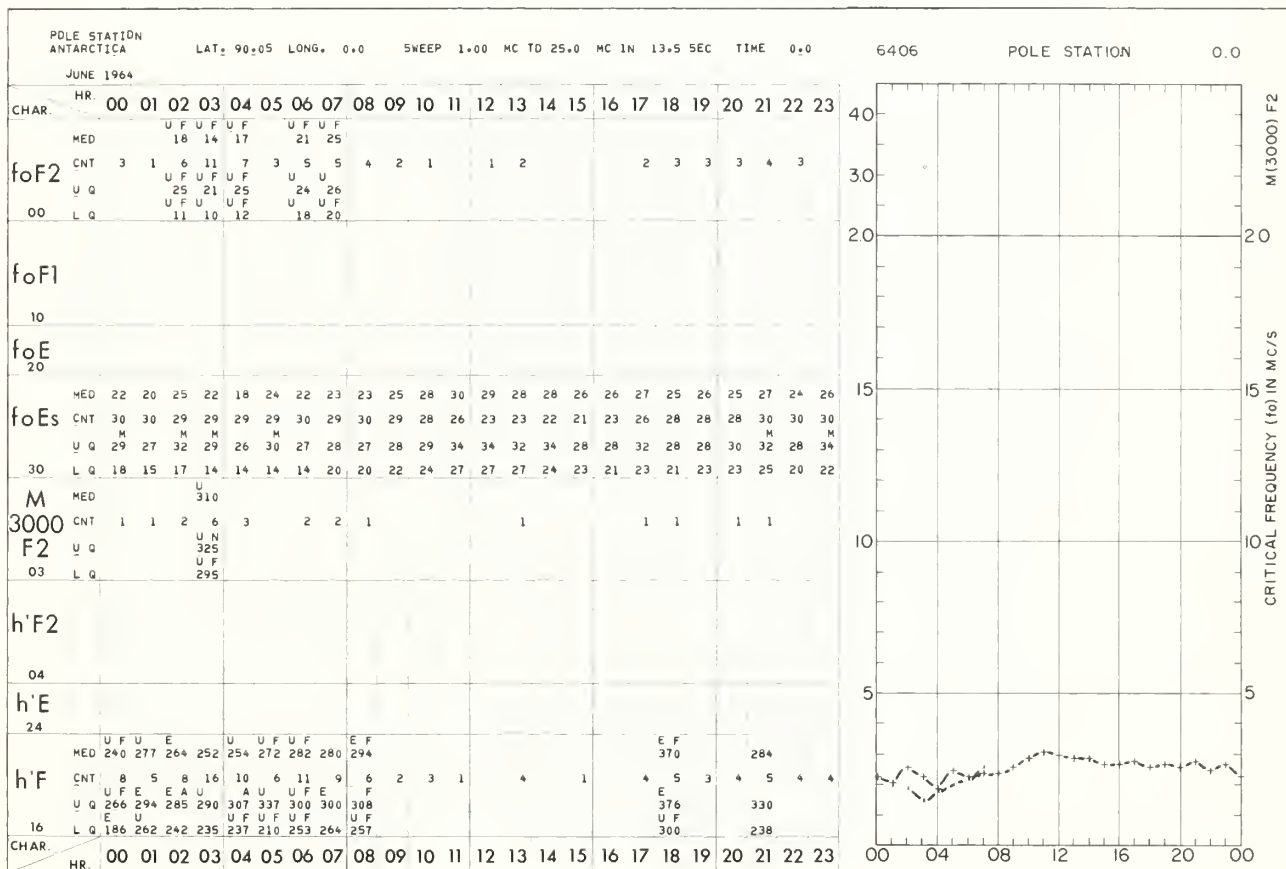
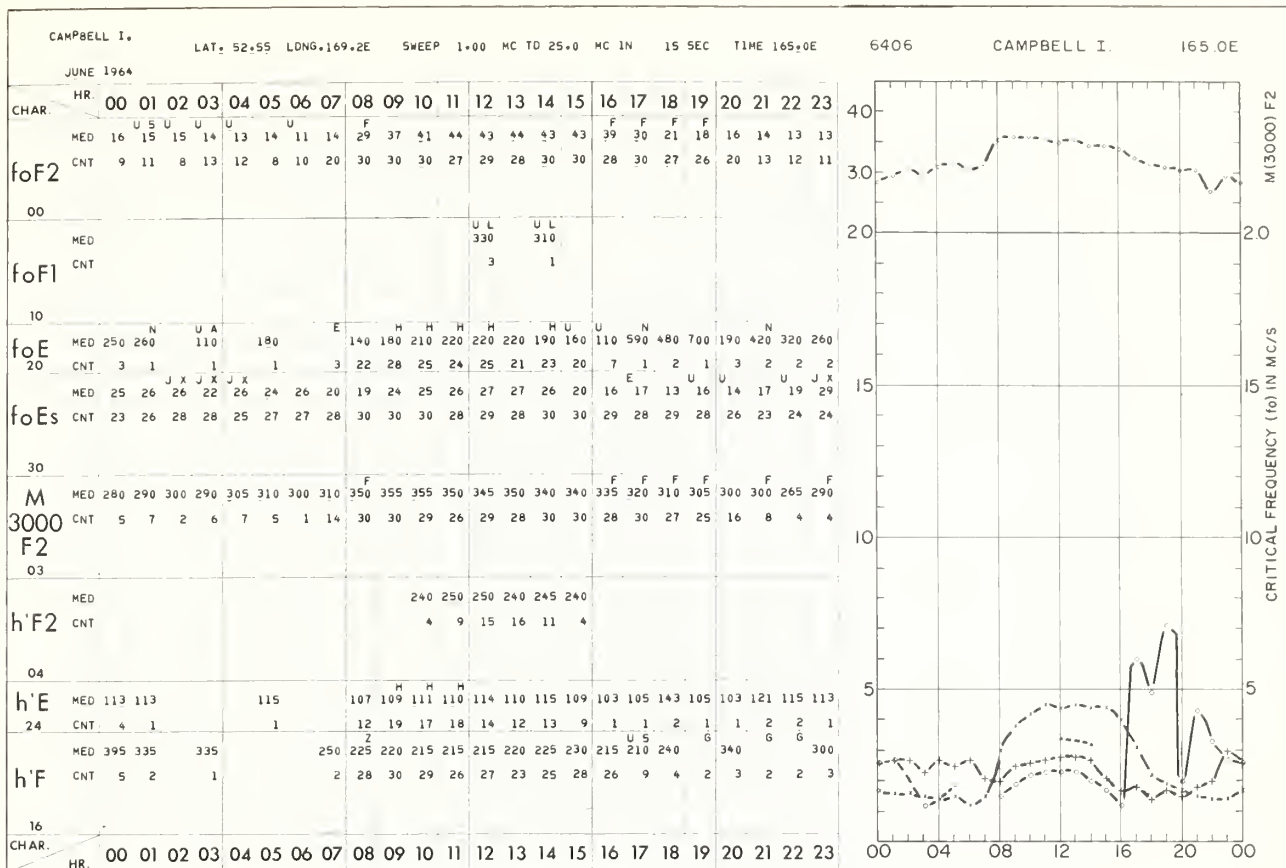


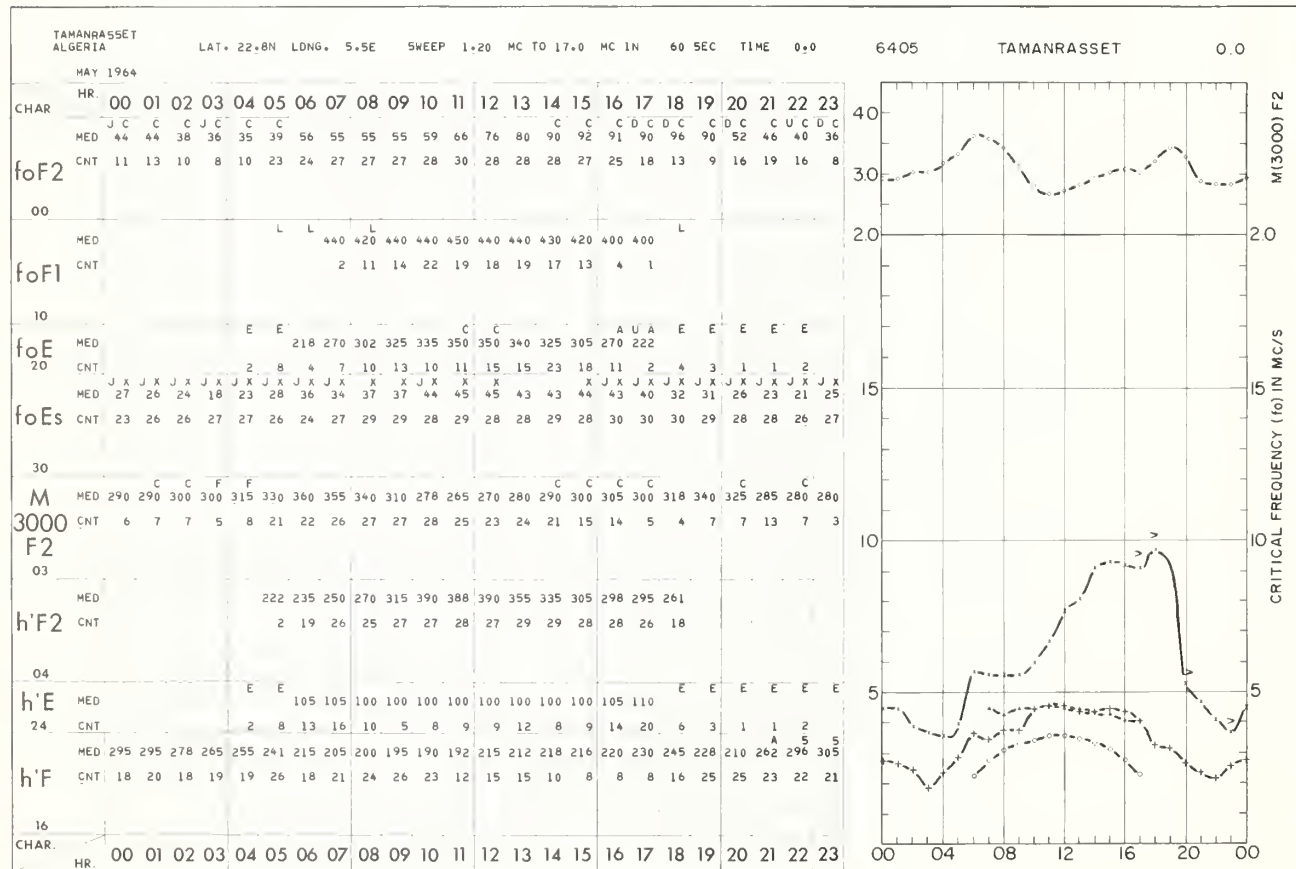
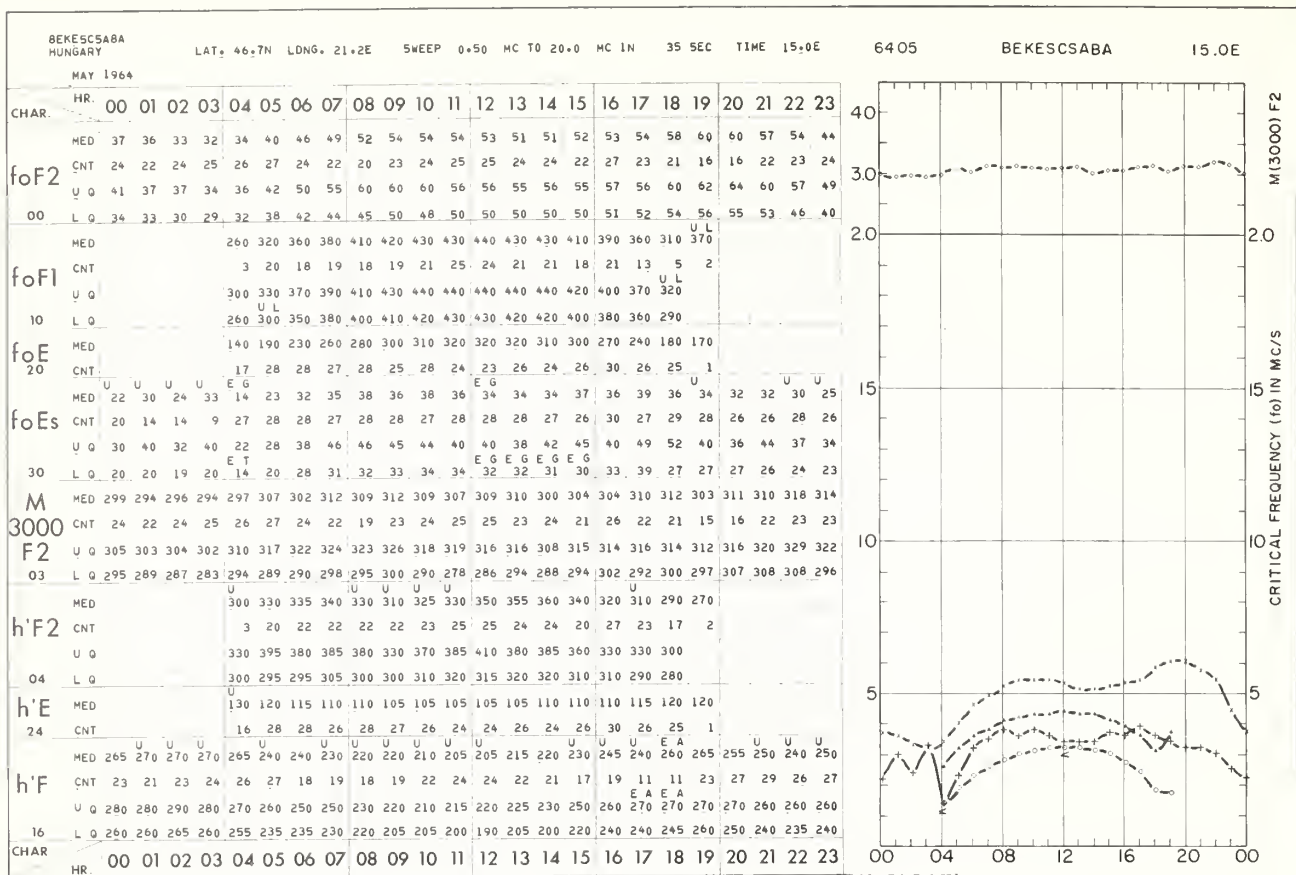


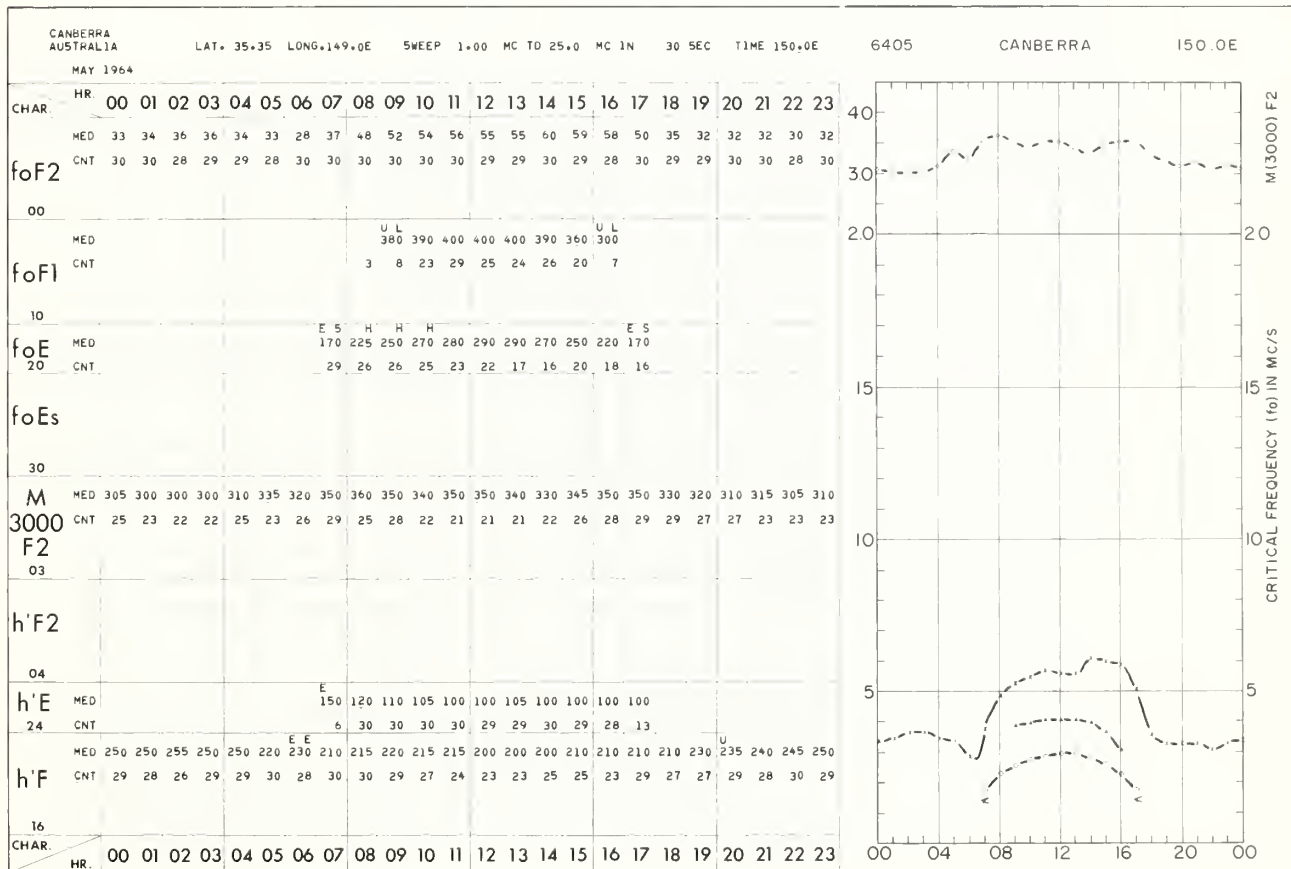
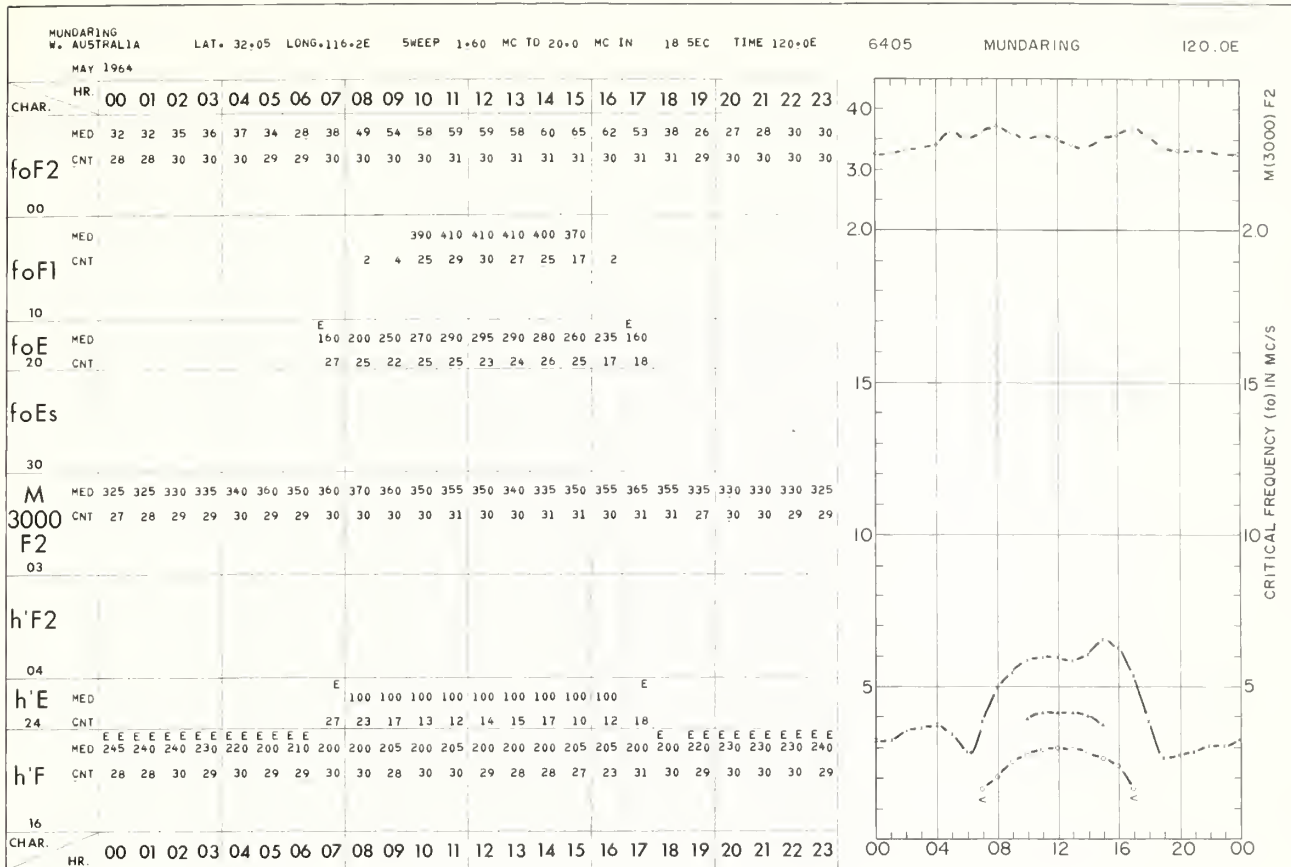


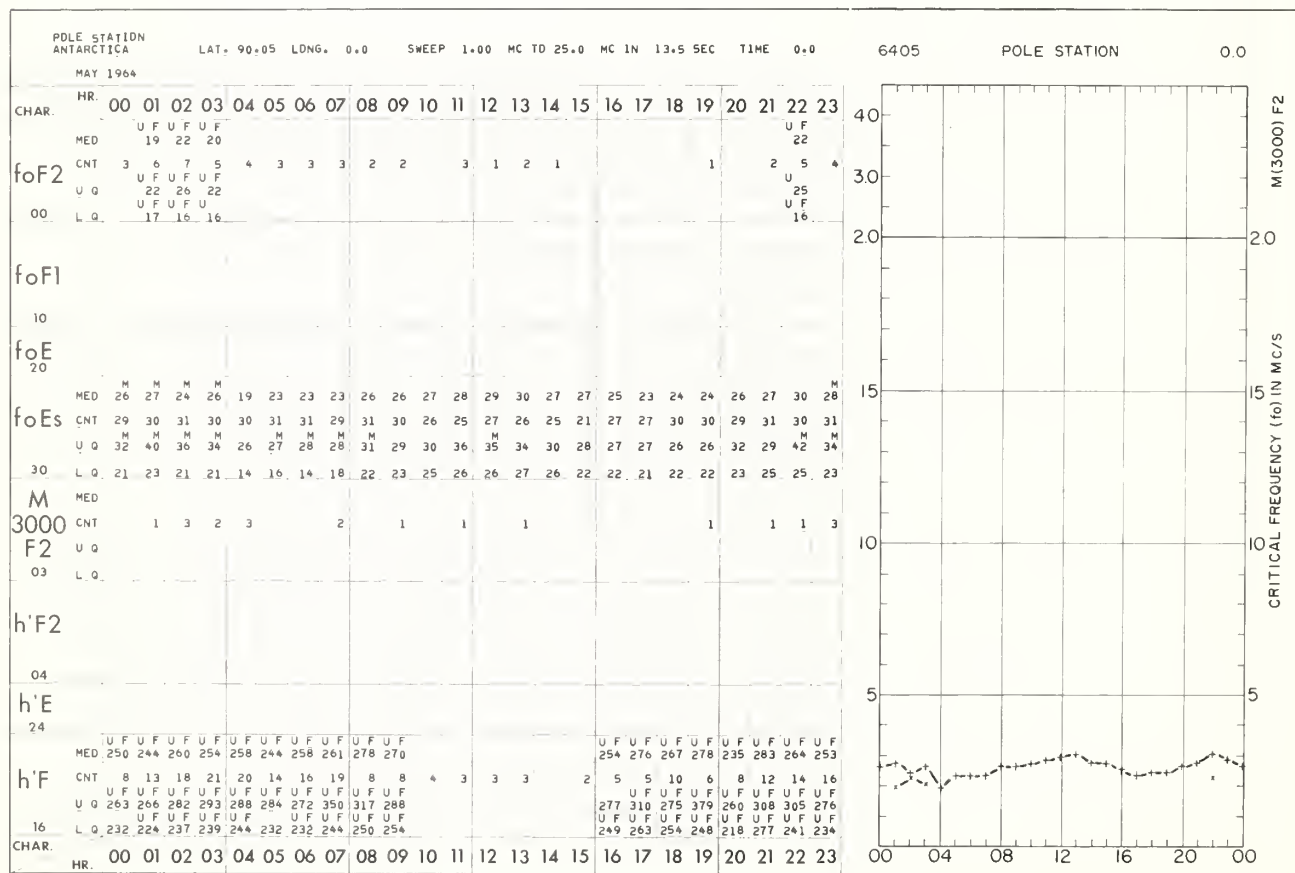
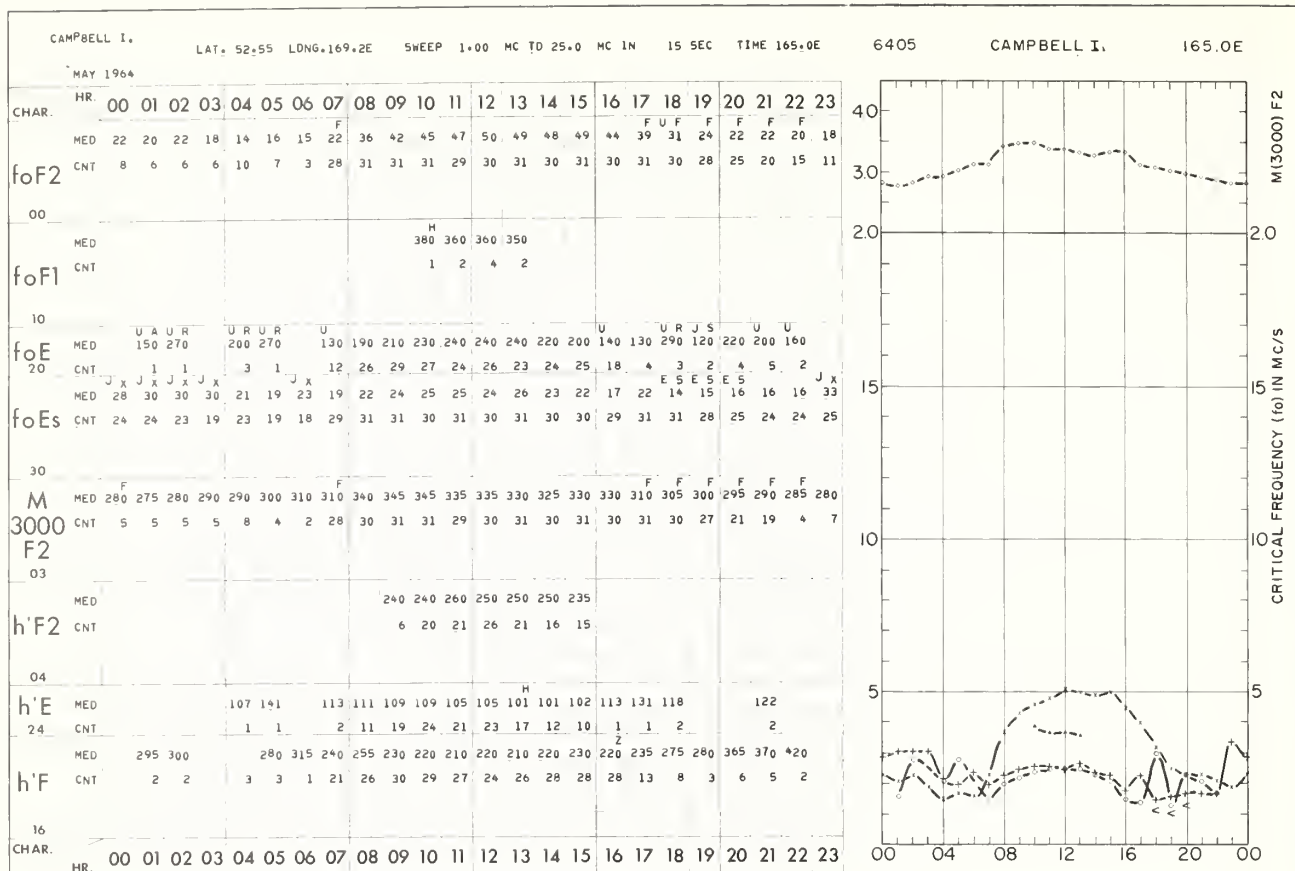






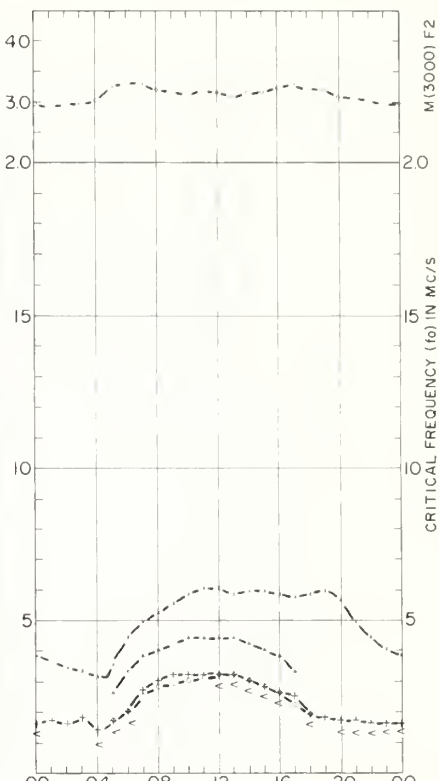






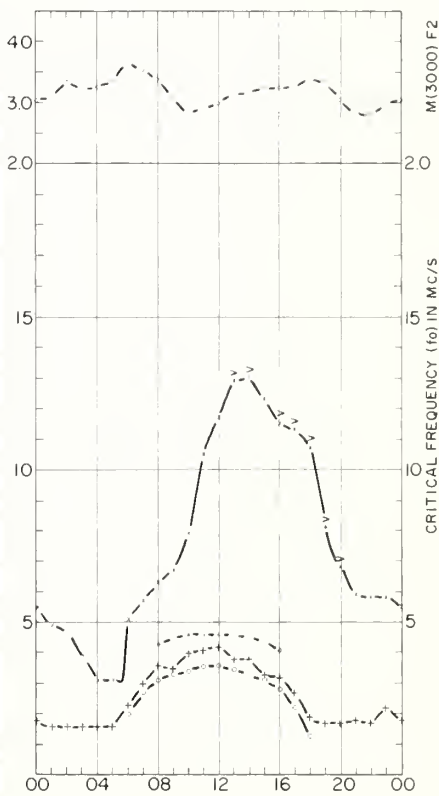
BEKESCSABA HUNGARY		LAT. 46°7N LONG. 21°2E		SWEEP 0.50 MC TO 20.0 MC IN		35 SEC TIME 15.0E																				
APRIL 1964																										
CHAR.	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
foF2	MED	38	36	34	33	31	35	44	49	52	55	58	60	60	58	59	59	58	57	58	59	56	49	44	40	
	CNT	27	25	28	27	28	27	28	25	26	27	28	26	28	26	27	26	25	25	21	23	28	24	26	26	
	U Q	40	38	36	35	34	40	48	54	55	62	64	63	64	61	63	61	64	62	60	60	59	54	48	43	
	00	L Q	35	34	32	30	27	33	41	46	50	51	53	54	55	56	55	55	54	54	54	51	51	44	39	37
foF1	MED																									
	CNT																									
	U Q																									
	10	L Q																								
foE	MED																									
	CNT																									
	E S																									
	20	MED	16	17	16	18	14	17	20	27	30	32	32	32	30	28	26	25	19	18	17	17	16	16	16	
foEs	CNT	12	2	4	2	4	23	27	28	28	28	28	26	28	26	27	26	26	28	23	20	18	21	15	14	
	E S																									
	U Q	17																								
	30	L Q	16																							
M	MED	296	291	296	296	302	324	330	328	319	317	310	317	315	307	314	316	322	328	320	318	307	304	302	294	
	CNT	27	25	28	27	28	27	28	25	24	27	28	26	28	25	27	25	24	24	21	21	28	24	26	25	
	F2	U Q	303	298	303	300	312	332	339	341	330	323	332	325	322	317	322	324	328	331	327	324	322	310	312	304
	03	L Q	288	286	284	288	296	306	315	318	300	302	293	301	307	298	303	308	318	320	312	310	300	290	290	287
h'F2	MED																									
	CNT																									
	U Q																									
	04	L Q																								
h'E	MED																									
	CNT																									
	U Q																									
	24	L Q																								
h'F	MED																									
	CNT																									
	U Q																									
	16	L Q																								
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

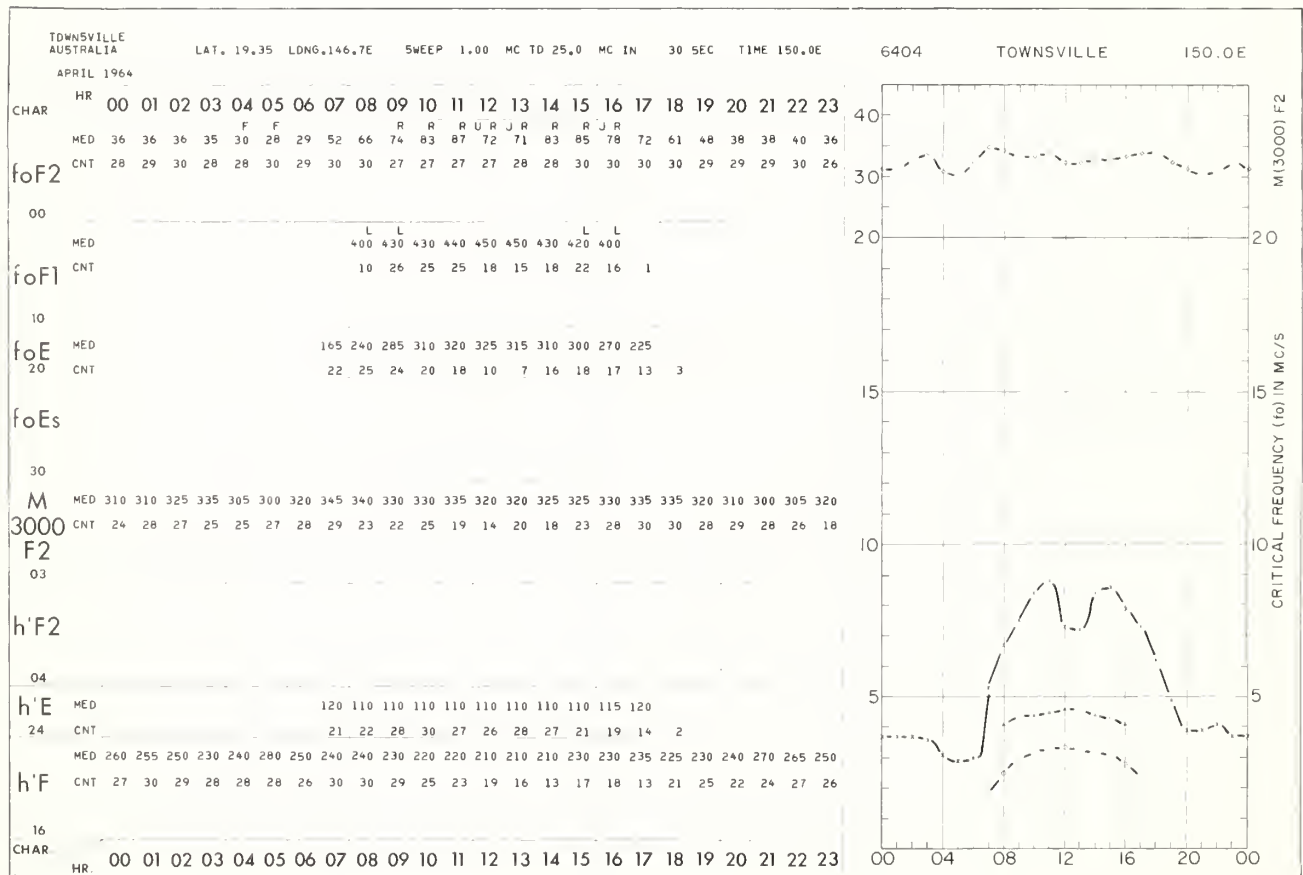
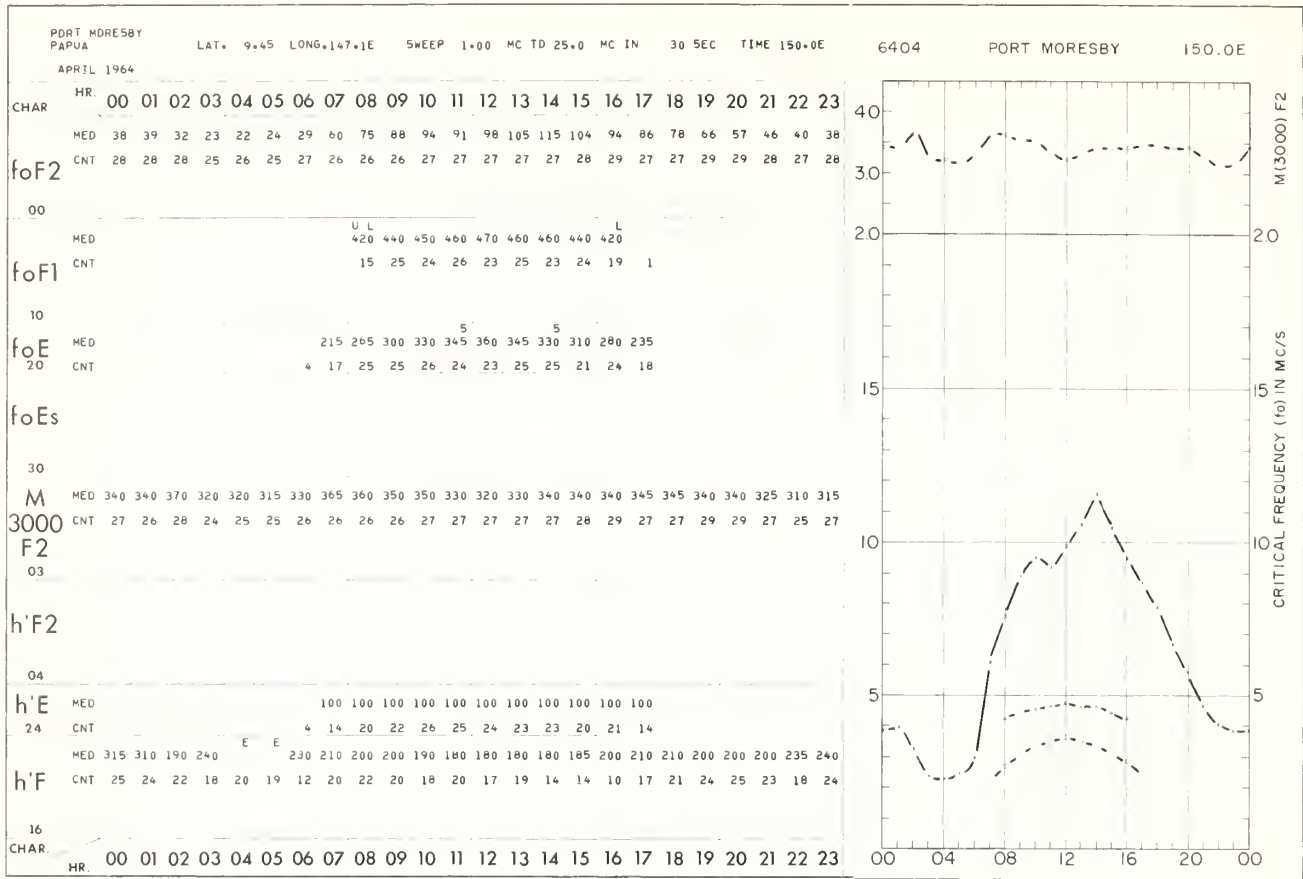
6404 BEKESCSABA 15.0E

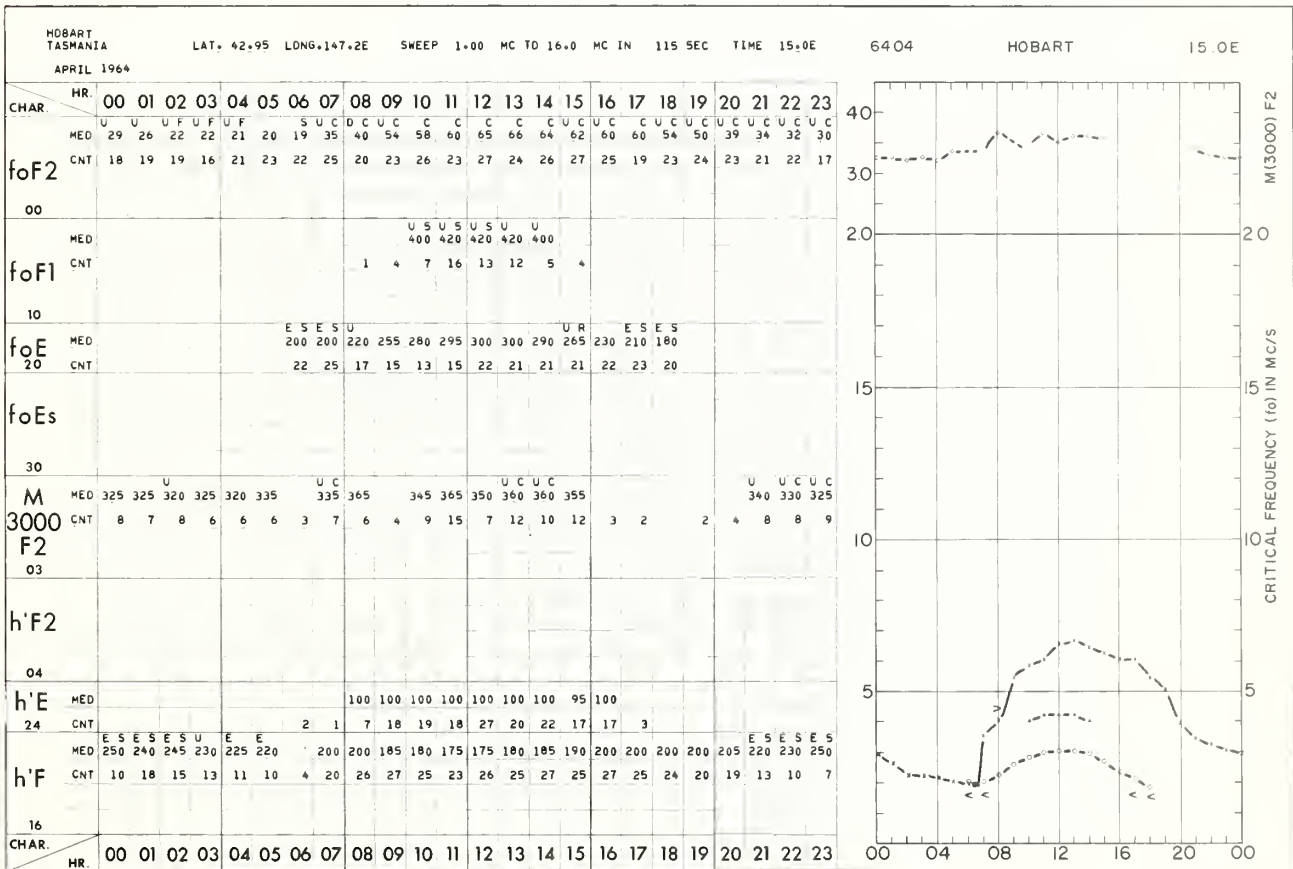
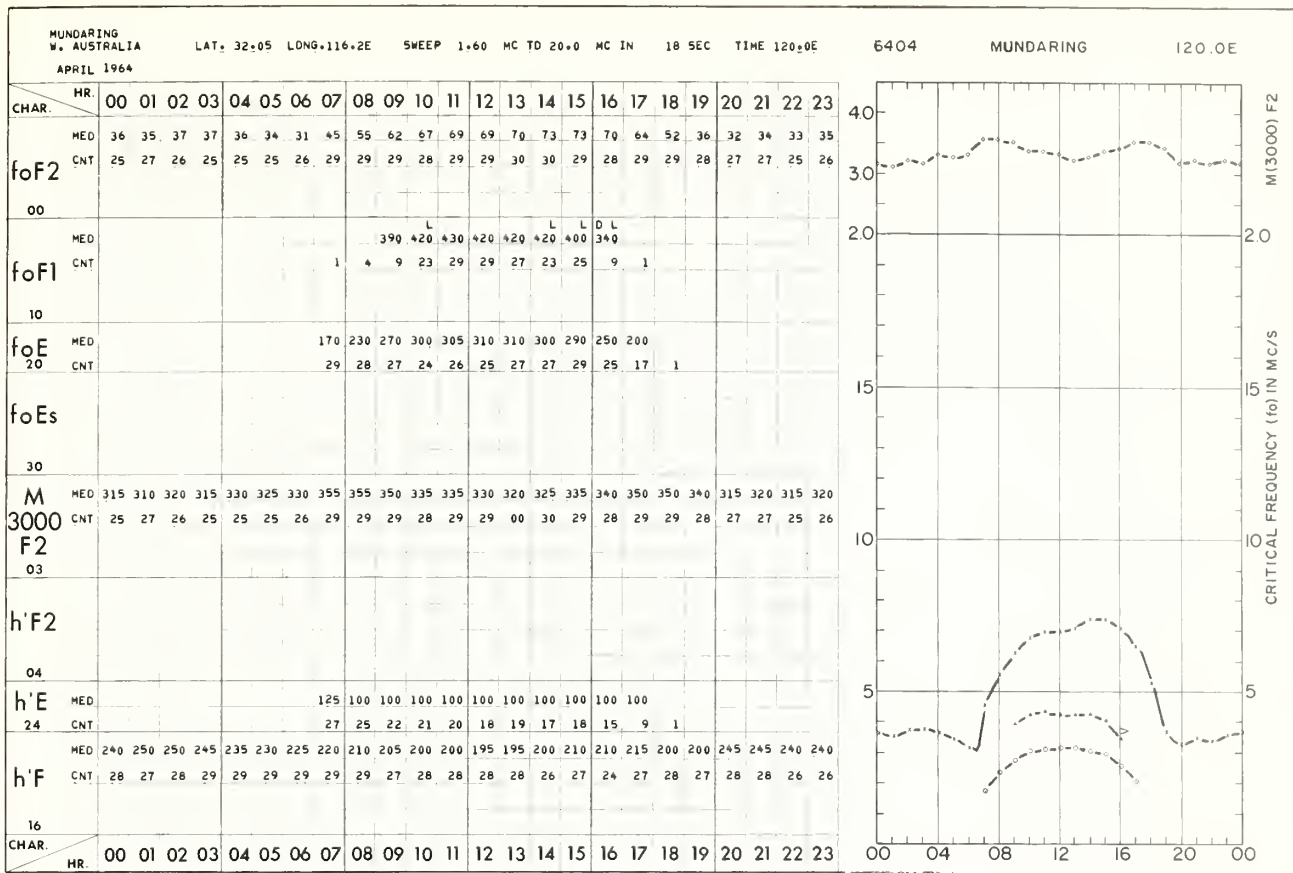


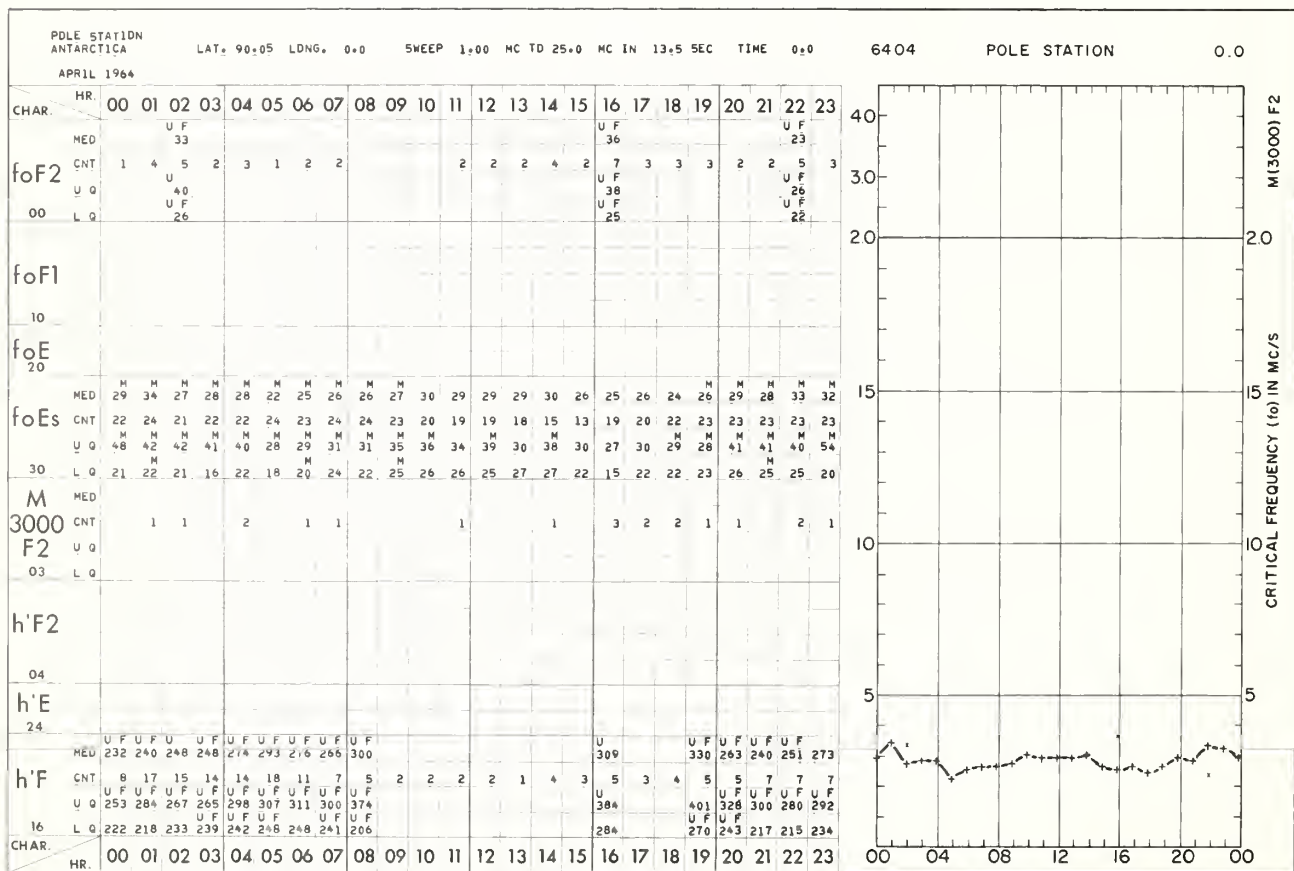
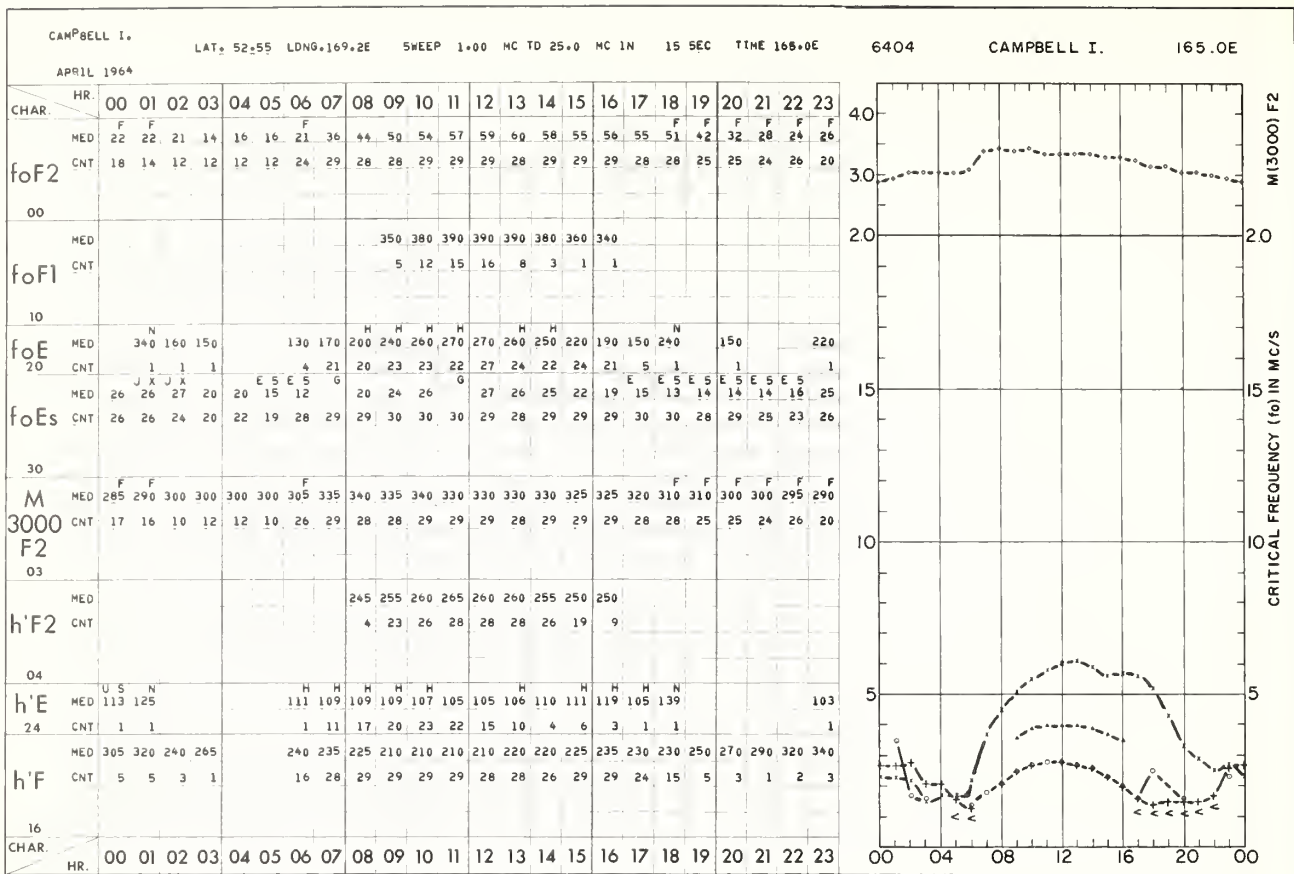
TAMANRASSET ALGERIA		LAT. 22.8N LONG. 5.5E		SWEEP 1.20 MC TO 17.0 MC IN		60 SEC TIME 0.0																			
APRIL 1964																									
CHAR	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	J C U C J C C J C C																								
foF2	MED	54	48	46	38	30	30	50	56	62	66	78	104	116	128	129	122	114	112	106	80	67	58	57	57
	CNT	12	16	16	20	16	20	26	26	26	27	27	28	26	25	24	27	25	20	25	12	20	15	16	14
	00																								
	MED																								
foF1	CNT																								
	10																								
foE	MED																								
20	CNT																								
	J X J X J X J X J X																								
foEs	MED	17	15	15	15	15	15	22	29	35	34	39	40	41	37	37	32	31	26	18	16	16	17	16	21
	CNT	19	26	26	27	27	23	24	25	24	27	27	28	29	28	29	29	29	29	28	18	16	13	20	18
	30																								
M	MED	300	305	330	320	322	332	360	350	335	305	278	288	295	312	312	320	320	322	335	330	300	280	275	290
3000	CNT	5	10	10	13	8	14	24	25	26	27	24	14	13	10	10	15	11	2	4	3	8	9	9	7
F2																									
03																									
	MED																								
h'F2	CNT																								
	U Q																								
	04	L Q																							
h'E	MED																								
24	CNT																								
	U Q																								
h'F	MED	275	255	212	226	250	240	225	215	200	200	200	195	190	198	200	210	218	230	235	220	238	275	298	295
	CNT	20	24	23	24	26	21	24	23	23	27	25	23	19	24	23	28	27	23	27	28	27	25	23	22
	16	L Q																							
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

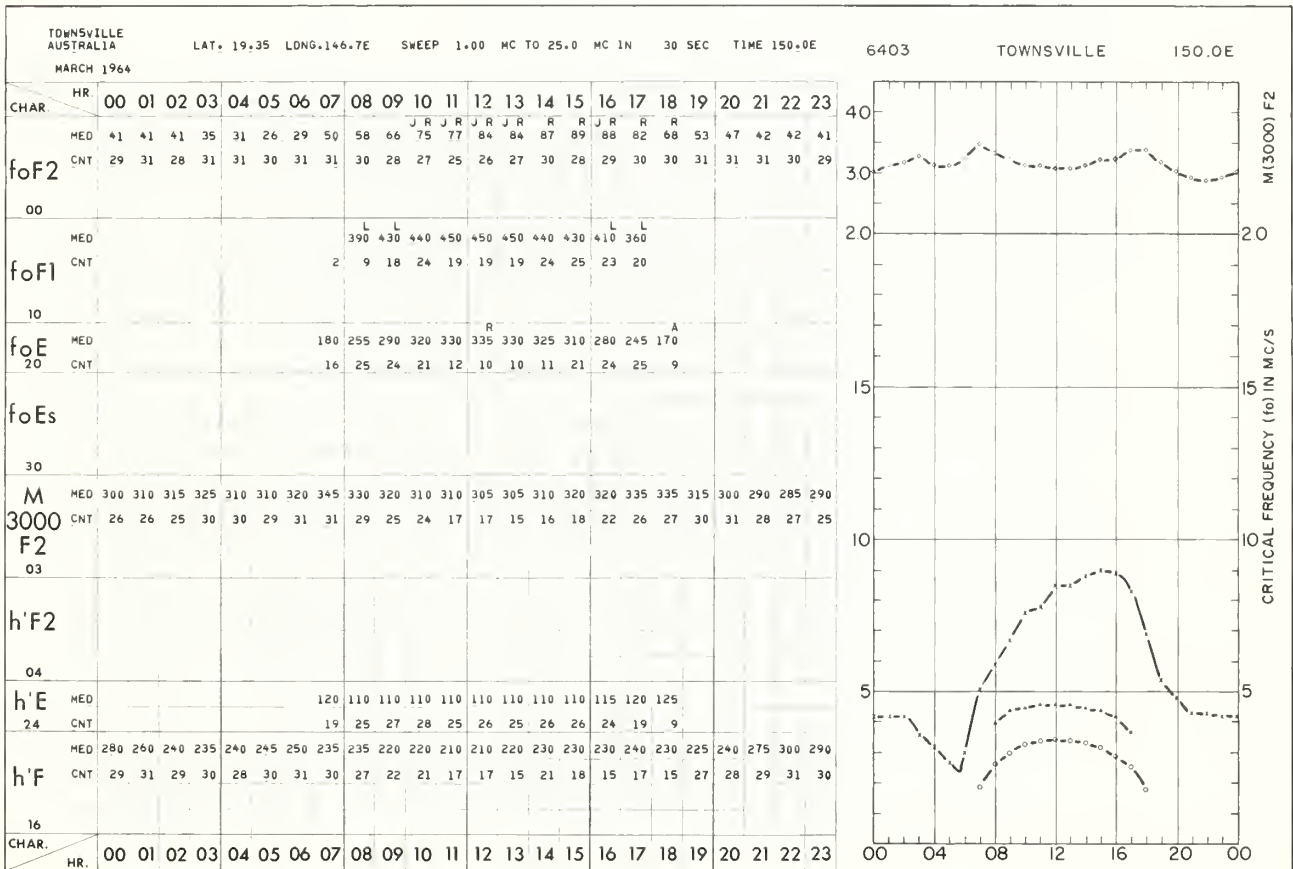
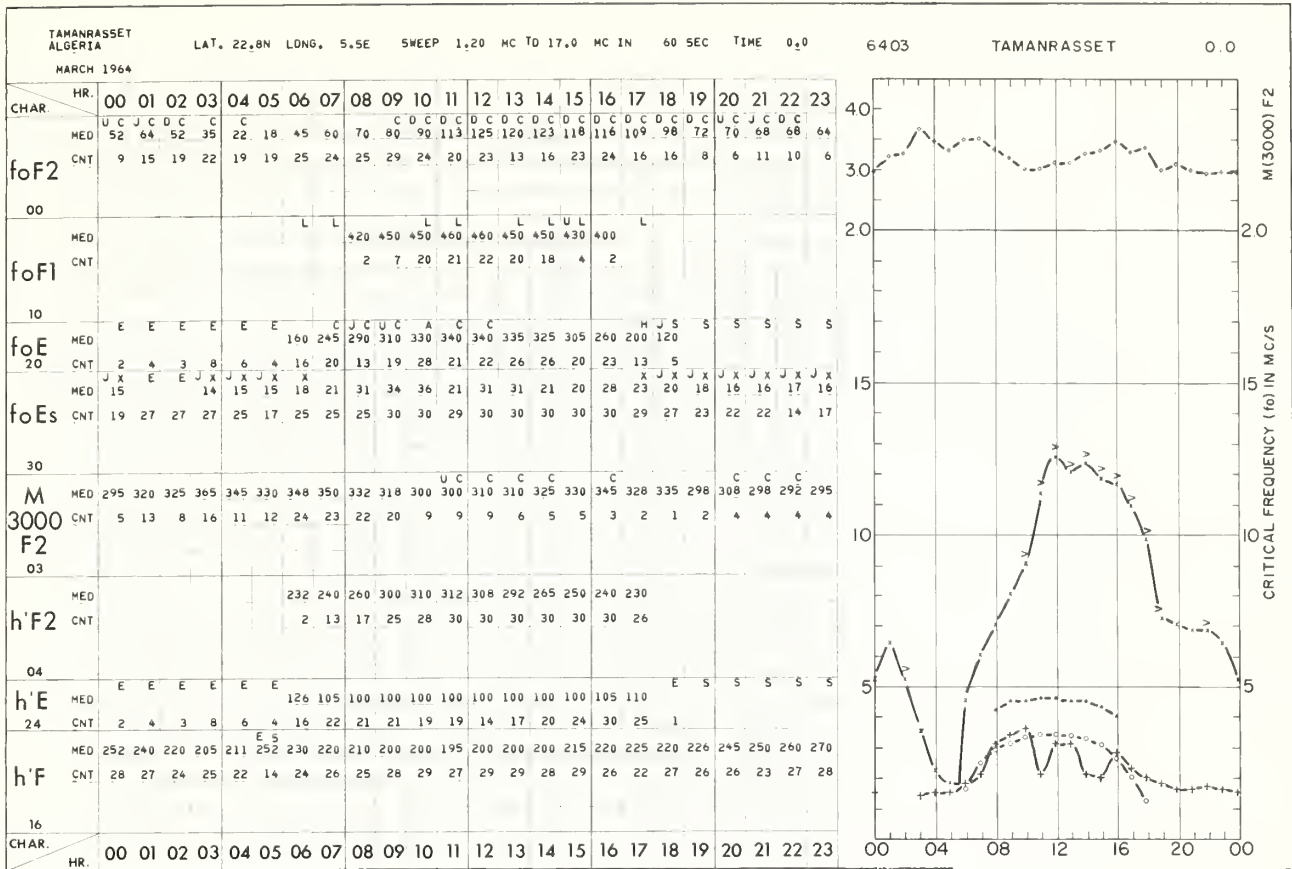
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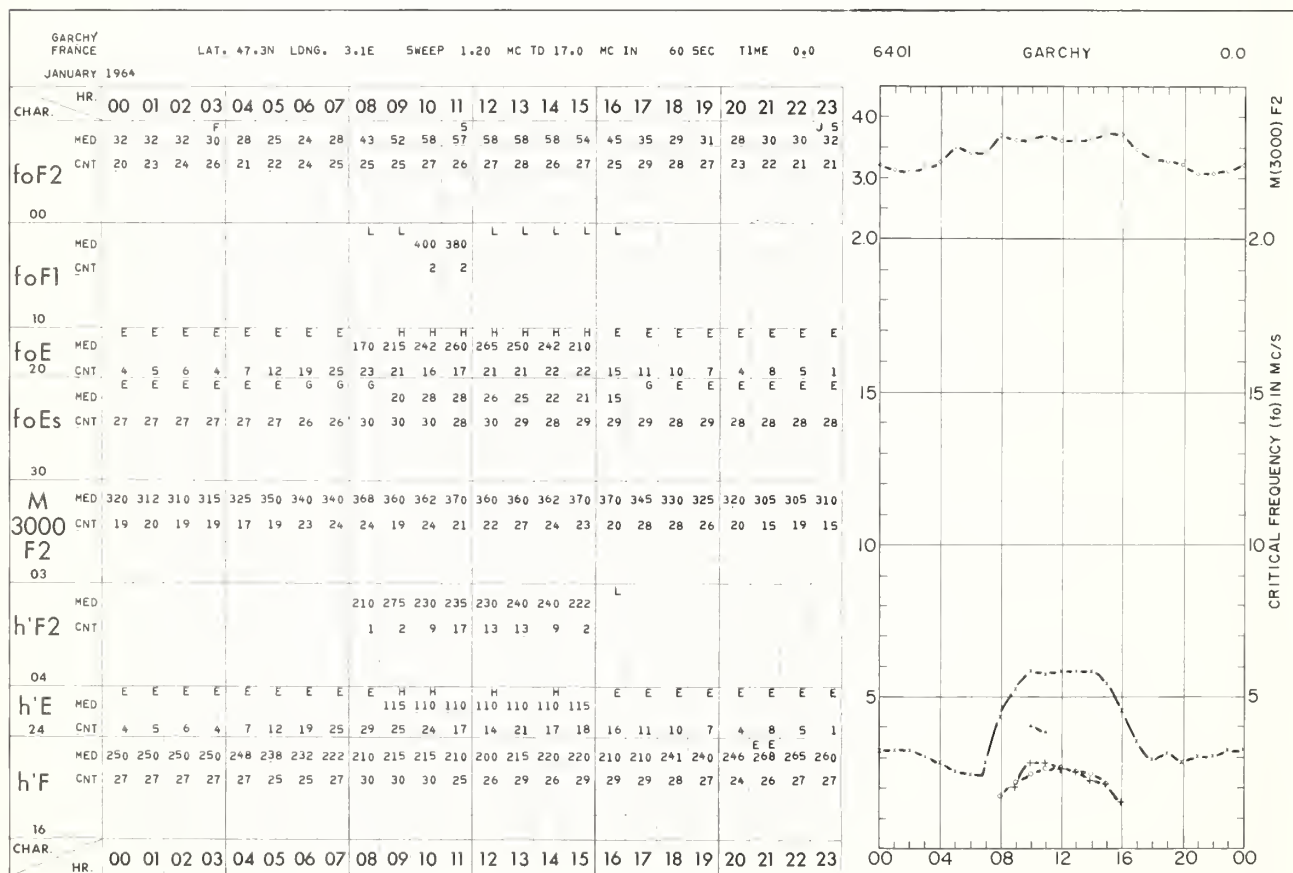
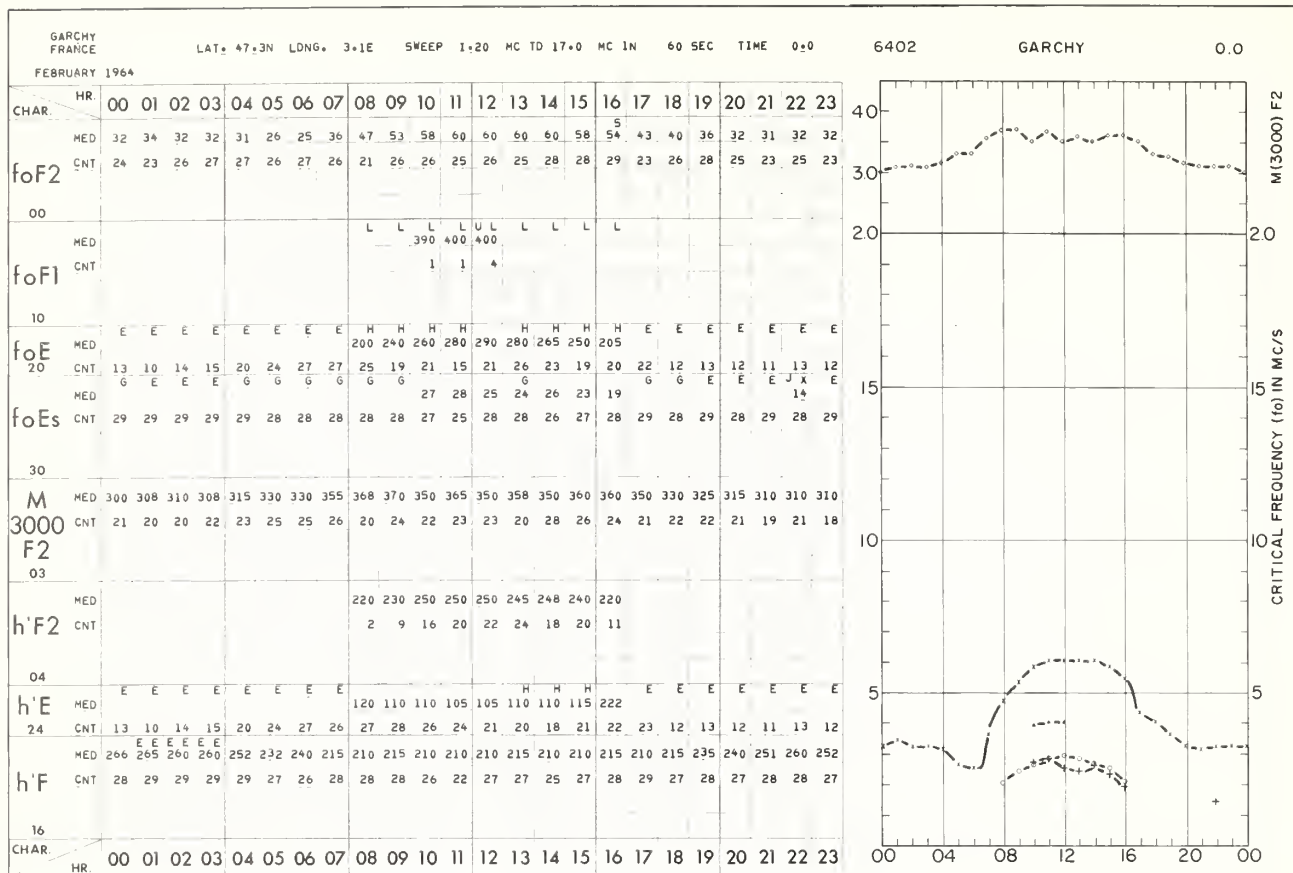












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